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KEROSENE BURNER.

The annexed engravings represent views of what is known as a solar kerosene burner, which is very effective in giving great brilliancy of light. It is simple, strong and durable; these qualities rendering it a favorite in the household and all places where kerosene oil is used as an illuminative.

Fig. 1 shows the upper part of a lamp with burner and glass complete; and fig. 2 illustrates the manner in which the wick of the lamp can be trimmed. From fig. 1 it will be noticed that the bottom of the chimney rests upon a corrugated base, and a metal disc, with a leathern cushion around its outer edge, receives and holds the chimney in its place. This cushion—being a non-conductor of heat—prevents the chimney breaking from heat. The cone or dome of the burner is supported by the disc, and is made so that it can be thrown back or removed entirely, thus exposing the wick for trimming. This burner is so made that it will not become heated, so as to generate explosive gas from the oil, and the danger of explosion from this cause, so common in all burners heretofore in use, is thus entirely obviated.

The burners are made either with the leathern cushions or with metallic discs, but in such a manner that the glass does not touch the disc. The advantages claimed for these kerosene burners are that they produce a very superior light, perhaps better than any other burner now in use; the chimney always keeps so cool that it can be readily removed with the hand; the burner can be easily lighted by a taper passed into the chimney from the top. These burners are manufactured by the Scovill Manufacturing Company, whose extensive works are at Waterbury, Conn. The manufactory has great facilities for making the burners illustrated here, and also for all work of sheet brass, German silver, and plated metal. The company have a capital of 350,000 dollars, and are well known as extensive manufacturers of kerosene oil burners, lamp-trimmings, &c. All further information may be obtained at No. 4 Beekman street and 36 Park Row, New York City.

FIG. 1.

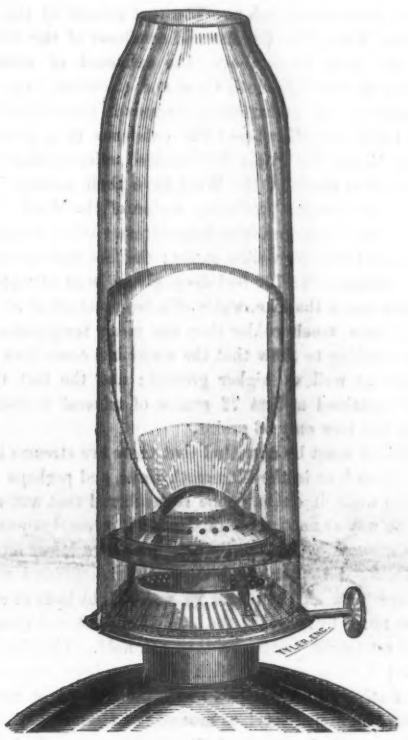
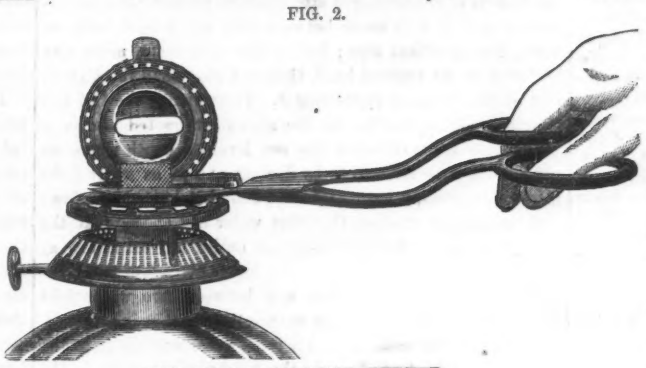


FIG. 2.



THE SOLAR KEROSINE BURNER.

The Alexandria Canal Aqueduct and Bridge.

The original construction of the aqueduct of the Alexandria Canal over the Potomac at Georgetown, was a great work, which at the time—about thirty years ago—attracted the attention of engineers and scientific men, not only in this country, but in Europe. It was built under the superintendence of Major Turnbull, of the United States Topographical Engineers, and cost nearly two million dollars. The piers, nine in number, are more than thirty-six feet above high water mark, and are solely built of blue gneiss, and embedded seventeen feet in the bottom of the river, with a foundation of solid rock. The object was to place them so firmly that they would stand unshaken by the tremendous shock of the spring floods and ice, which from the falls and narrows above were wont to rush down with an irresistible force, sweeping along everything in their course. These piers, constructed in the most masterly manner, it is well known, have stood those shocks as if they were part of the native rock of the river. The length of the aqueduct is 1,446 feet. The superstructure of timber gradually decayed and became dangerous, so that the lessees of the canal were compelled to rebuild it if they wished to use it. The contract for rebuilding the wood work is nearly completed, and in so substantial a manner, and with such perfectness of symmetry, combining in the Howe truss all that is necessary for the purpose, that it commands the admiration of all who have seen it, comparing very favorably with any like structure in this country. The contractors, Messrs. A. B. Burton & Co., of Philadelphia, may well be satisfied with their labor. Their contract, however, does not include the erection of the bridge from the end of the aqueduct over the canal to the shore, and the Georgetown side, nor the planking of the top of the framework, which is to constitute the bridge, if the project as contemplated is carried to completion. The planking of the aqueduct is of southern pine, and seems to be done in a durable manner.

Vegetation in the Moon.

It was for a long time the common conclusion among astronomers that the moon was without any atmosphere, and destitute of water; and that, consequently, neither animal nor vegetable life could be supported on its surface. But several eminent modern astronomers have maintained that the moon has an atmosphere, though of a very limited extent. And quite recently, Mr. Schawbe, a German astronomical professor, thinks he has discovered signs of vegetation on the surface of our satellite. It is well known that there are certain dark lines or scratches, as they appear, extending across the slopes of the highest mountains in the moon. These have been variously explained, some regarding them as the beds of dried-up streams; others as the channels left by torrents of lava; others as having some other origin. Professor Schawbe claimed to have discovered in these lines a greenish color, which appears at a certain season, lasts a few months, and then disappears. He therefore regards those lines as belts of vegetation. If his observations should be decisively confirmed by those of other astronomers, it will settle the question that the moon has both air and water, and will therefore remove any presumption against the existence of animal life on its surface.—*English Paper.*

California and Her Resources.

We are indebted to the N. Y. *Tribune* for the following condensed report of a very interesting lecture recently delivered in this city by the Hon. J. H. Warwick, a resident of the Golden State:

"The lecturer began by tracing the history of gold mining in this hemisphere from the date of the earliest traditions, and dwelt particularly upon the period when the Aztecs were a nation. These people, he said, never used gold as an article of commerce. They converted it into ornaments, which, for beauty of workmanship, have never been equalled. That they understood mining is evident from the fact that ruins of their mines are still traceable in the country which they once inhabited. Near Silver City, in Nevada, until very recently, might have been seen a shaft sunk, perhaps hundreds of years ago, by these primitive gold seekers. In Mexico, and in some parts of South America, it was once a settled law that no native should point out a gold mine to a foreigner, on pain of instant death. Only thirty-three years ago, Forbes, in his history of California, wrote, that in Upper California, there were no indications of mineral deposits. In 1842, James Dana wrote that the country was rich in gold and other metals. In 1846, a settler informed James Buchanan, then Secretary of State, that the precious ore was abundant, but that it could not be mined for years to come. In January, 1848, ten days before the signing of the treaty with Mexico, the magic cry of "Gold in California," began to echo from the wilds of the Pacific Coast. On the 19th of that month, one Marshall, a workman on the land of Col. John A. Suter, struck a vein of the shining metal with his pick. In less than sixty days, mines were struck in all parts of the auriferous region. Men left their ordinary avocations to search for gold. Hardships of all kinds were undergone for its sake. Soon the news reached the East, and thousands flocked to the new land of promise. Foreign countries poured their legions of adventurers upon the shores of Western El Dorada. For a long time the wildest hopes of the most sanguine wealth-seeker were more than realized, for the yield of the diggings was from one ounce to many pounds per man. Clumsy workmen made dollars, where before they had been satisfied with dimes; and men of tact and enterprise, aided by good luck, were able to retire with ample fortunes at the end of a few weeks.

"In 1853, the riches of the placer mines began to decrease, and the attention of miners was turned to the subject of quartz. Companies were formed, and vast sums were spent for machinery, most of which soon proved worthless. Much money was lost, too, through the dishonesty and incompetency of superintendents and others; and at this time an event occurred which threatened to ruin the quartz interest. This was the failure of the Adams Express Company, the great monopoly of California. This company was not only a common carrier; it was the bank of nearly every miner in the State, and held in trust millions of dollars belonging to the confiding diggers. Much of this wealth was in bags of dust, which had never been weighed, and for which, in many instances, no receipt had ever been demanded. This failure drove the mining population to madness, for there was hardly a man in the gold country whose whole fortune was not swept away by the untoward disaster. But the failure of Adams's Express Company was not without its good results. It opened the eyes of the people to the want of banks and a good financial system, and these were in time established. The agricultural interests of the new country were fostered, and California began to raise her own bread. Then began the formation of that great chain of events which led at last to the building of the Pacific Railroads.

"The lecturer presented a mass of interesting statistics showing the immense wealth of California in products of the soil, vegetable and mineral. In ten years the profits of one mine in Sierra were $1,000,000, and this, he said, is not a solitary instance. Another mine, which he described as having a shaft 1,200 feet down into the earth, yields $200,000 a year. About Grass Valley, in Nevada County, the yield is $4,000,000 annually. In 1866 the amount of wool sheared was 7,000,000 pounds. This year it will be 10,000,000. California now makes her own leather, and exports $5,000,000 worth annually. She is raising cocoons, too, for which her climate is well adapted, and has one silk factory near San Jose already in operation, and others springing up. Last year her wheat crop was worth $30,000,000. The inducements offered to labor, talent and genius are great. The air of the Pacific coast is pure and sweet. Such a thing as a sultry day or night is unknown. Labor is well rewarded, and living is about one-half what it is in the East. Mr. Warwick closed by inviting capitalists to promote their interests by investing in manufactures in California, promising them a rich return for every dollar thus laid out."

Remarkable Mining Relics.

At different places in East Tennessee, where there are veins of copper, zinc, or lead ore, there found excavations that must have been made hundreds of years before that section was settled by our people. So far extensive are some of the excavations that to make them now, with all modern facilities, would require an expenditure of thousands of dollars. The rocks seem to have been fractured by heat-

ing and throwing water upon them. Some persons suppose that these excavations were made by Spaniards, who were in search of precious metals.

International Coinage.

The appointment by Queen Victoria of a commission to consider the subject of international coinage, with reference to the plan proposed by the Conference of Paris, seems to us of itself reason sufficient why Congress should not be betrayed into the hasty legislation on this subject which is urged by Mr. Ruggles and Senator Sherman. We have already given some grounds for rejecting the Paris plan altogether; but even if the obvious advantages of general monetary uniformity were great enough to counterbalance the objections which have been raised, the non-concurrence of England would be fatal to its success. Our commerce with that country and her possessions, is nine times as valuable as that of France, Belgium and Switzerland; and, if we must yield, for commercial reasons, our monetary system, we could better afford to compromise with England, though all the world beside stood aloof, than to separate ourselves from India, Canada and Great Britain, for the sake of a "monetary unity from San Francisco to Constantinople." Yet the proceedings of the Paris Conference show that the English delegates, one of whom is a member of the new British Commission, declared that they "could not vote for any question tending to bind their government, or express any opinion to induce the belief that Great Britain would adopt the convention of 1865," by which he meant the quadripartite convention between France, Belgium, Switzerland and Italy, extending the French system over all those countries. We could wish that Mr. Ruggles had emulated the conversation of this declaration, which contains also the significant statement that the British Government, occupying a position "much more independent upon this question than most continental nations," could not believe it to be its duty, "so long as public opinion has not decided in favor of a change of the present system, which offers no serious inconveniences, either in wholesale or retail trade, and until it shall be incontestably demonstrated that a new system offers advantages sufficiently commanding to justify the abandonment of that which is approved by experience and rooted in the habits of the people," to volunteer a change, for the sake of assimilation. Perhaps the English delegates overrated the binding effect which the discussions of the Conference, and the speeches of its individual members, were expected to exert upon the governments represented; but the spirit of their declaration was right. An international convention is the place where such questions should be discussed, not decided. The degree to which the proposed changes would affect our internal trade and convenience, it was of course impossible to discuss among strangers, speaking different tongues, and wholly unable to comprehend anything more than certain commercial and statistical bearings of the case. Congress might refer this subject to an American scientific commission as able and impartial as that which has just been nominated in England; if it does not do this it should reject Mr. Ruggles' plan altogether. The latter measure would certainly be a safe one, and it is called for by many of our most capable experts. The American Association for the Advancement of Science, the American Statistical Association, and other scientific bodies, have protested against an ill-considered change of the present American dollar; while, so far as we can learn, no petitions from the people, nor recommendations from eminent authorities, are found supporting the French plan. M. Chevalier, the foremost of French economists, denounces the "unmetrical" monetary system of his own country; and all who appreciate the importance of uniform weights and measures, in other words, of the adoption of the metrical system by all nations, must deplore the presentation of a plan which will prevent the use of the most efficient means for the establishment of that uniformity. One influence which has long been recognized as retarding the general adoption by the French people, in daily life, of the metre and the gramme, has been the lack of familiar representatives, in common use, of those units; and coins of metrical size and metrical weight would be, in France, and in all other lands as well, the most powerful agents that could be devised to effect the adoption of that system. Add to this an unalterable fineness, and we should have at once a monetary unity, every coin being current according to its weight, expressed in grammes upon its face. In 1819, the House of Representatives required of John Quincy Adams, then Secretary of State, a report upon this subject. He addressed himself with deliberation to the work, and presented in 1821, a document which is to-day received throughout the civilized world as a classical authority upon coinage. Americans only seem to have forgotten the principles which he so wisely laid down, and the great importance which he attached to the simple ratio between the value and weight of coins.—*New York Post.*

Important to Assayers.

The Commissioner of Internal Revenue thus decides the question of the liability of foreign bullion to be taxed, under the internal revenue laws. Foreign gold dust is liable, but assayed bullion is not:

TREASURY DEPARTMENT,
OFFICE OF INTERNAL REVENUE,
WASHINGTON, January 14, 1868.

Lewis G. Gunn, Esq., United States Assessor, San Francisco, California:

SIR—My attention has been called by Dr. Hewston, Superintendent of the San Francisco Assaying and Refining Works, on behalf of the Assayers and Refiners of bullion at San Francisco, California, to the subject of taxing bullion produced outside of the United States and assayed, refined, and coined in this country, or transported out of the country.

From an examination of the Act of June 30, 1864, as reported by the Committee of Ways and Means, and of the successive modifications of the particular clause of the ninety-fourth section relating to bullion made prior to the final passage of the bill, I am satisfied that it was the intention of Congress to impose the tax upon the *production* of gold and silver, and not upon the processes of assaying or refining bullion, considered in the light of manufacturing or producing processes.

This being the case, I can see no good reason for imposing any restrictions upon the assaying, refining, or coinage of gold of foreign production, which would have a tendency to discourage the importation of gold or encourage its exportation.

Whenever, therefore, it can be clearly and satisfactorily shown by the assayer that gold assayed by him is of foreign production, he will not be required to pay the tax of one-half of one per cent. The only inquiry which need be instituted will relate to the *origin* of the gold, leaving the future or final disposition thereof to be determined according to the pleasure of the owner. When an assayer claims exemption from the tax on the ground that the gold is of foreign production, he should be able to show from the entries, made upon his books at the time the gold was received by him, of the names of the parties depositing the same, numbers, stamps, etc., affixed by previous assayers, that the gold in question was beyond doubt of foreign production. All gold dust deposited for refining and assaying must be regarded as liable to the tax of one-half of one per cent.

The substance of this letter you will please communicate to the several assayers in your district, and also to the Superintendent of the United States Mint.

Yours, respectfully, E. A. ROLLINS, Commissioner.

Original Papers.

WRITTEN FOR THE AMERICAN JOURNAL OF MINING.

FEEDERS OF THE GREAT LAKES.

BY BENJAMIN SMITH LYMAN.

About a year ago, in a periodical of justly high scientific reputation, prominence was given to a theory that the great lakes, particularly Lakes Superior and Michigan, were fed in great part by underground streams, coming from the Rocky Mountains. Such a view was thought to be quite proved by several arguments, such as: The vast amount of the water of Niagara Falls; the fewness and smallness of the rivers that feed the great lakes above; the existence of underground streams in the Mammoth Cave and elsewhere; the seeming presence of such underground streams in some artesian wells, as at Parry and elsewhere; the existence of a point in the Rocky Mountains within five hundred miles of which "nearly all the great rivers of the West have their sources," making it "the great water producing region of the West;" the fact that on the Western plains large streams often sink away into the ground with no visible outlet; the fact that artesian wells near Chicago, over 700 feet deep, give a head of water nearly 125 feet above the lake, water of a temperature of 59° at first, but 57° now, much colder than the mean temperature of the place, seeming to show that the water has come from a higher latitude as well as higher ground; and the fact that this water contained at first 72 grains of mineral matter to the gallon, but now only 56 grains.

While it must be admitted that there are streams that flow underground, as in the Mammoth Cave, and perhaps in some artesian wells, it ought to be remembered that water cannot run one way or another at random underground any more than above ground, but that it flows always to a lower level where not hindered by obstacles. Water underground would be hindered from sinking lower by water tight beds of rock, and just as much by reaching the level where the rocks are already as full of standing water as they can hold. This level would in general be certainly as high as the sea level, except in those comparatively small regions where the surface of the ground is itself below that level, as around the Caspian. Yet, besides the flow as of an uncovered stream above ground, these underground waters may move between two water-tight beds, as water does in a bent pipe; but in this case it can never rise higher than its original head, that is, higher than the highest part of the enclosure containing it. The water of the Chicago artesian wells, according to the statement quoted above, is taken from a depth below the sea level—a depth where no one can suppose streams to be flowing, except as water flows in pipes, between a water-tight bed above and another below; and the head of 125 feet that this water has, shows that the water-bearing bed has elsewhere an outlet at least as low as that.

The water inclosed in that way between two water-tight beds is, then, like water in an upturned siphon, or in a U tube. If an opening be made in such a tube, water will rise from the hole to a height depending on the height of the water in the two arms of the tube; and it is not necessary that the water shall have been flowing through the tube; it may have been merely standing there. If the water drawn off by the opening be replaced by water added to either arm of the tube, the same head will, of course, be kept up. The Chicago wells, instead of tapping an underground stream, may merely tap water that was standing in a low part of such a bent tube; and it is not necessary that it should have been standing in a large hollow or channel in the rocks, especially in one of the shape of a river; it may just as well have been spread through a bed of sand or gravel or other porous rock full of water. The mineral matter in the water, more at first than afterwards, would seem to come from the quiet standing of the water longer than the short time that is allowed to it, now that it runs off through the wells; and the great effect of small wells in this way would go to show that the supply of water was not very great. The change of temperature would indicate the same thing. The temperature of 57°, or that of 59°, would either of them be nothing unusual at a depth of 700 feet; and, according to Blogett's Isothermal Chart, would be about ten degrees higher (instead of much lower) than the mean yearly temperature of Chicago. The warmer water would seem to have lain at a lower depth than the water that was drawn afterwards. If the water had come underground all the way from the Rocky Mountains, a thousand miles away, it is not likely that a few small wells would have perceptibly affected either its temperature or its mineral contents.

The underground waters, if tapped at a favorable point, either naturally or artificially, would be in motion; and if there were hollows or cracks in the rocks, this motion would be something like the motion of rivers on the surface, and sometimes still more like the motion of water through a tube. But if there are no such channels for the water to run in, it must still move, more or less slowly, through the sand, gravel, or porous rocks: not indeed in the shape of a river, but with a general movement of the water throughout those materials, in all parts of the bed, with due reference, of course, in different parts of each bed, to the position of the nearest and lowest outlets. The well of Passy does not yield so unusual an amount of water as to prove the existence of any underground stream. This well taps the same watery bed of sand as the well of Grenelle near by; and, as the well of Passy is very large, some three times as wide as the other, and, therefore, nine times as large, it is not surprising that it should yield six million gallons a day, against one million of the other. It is not impossible that some watery beds may, in like manner, empty a certain amount of water into the great lakes from beyond the region their overground water-courses drain; but it is likely that quite as much is drained off from that region in the same way.

A glance at a geological map shows that there are no rock beds in the Rocky Mountain region mentioned, that could possibly convey water underground, as in a pipe, to the beds of the Great Lakes. Lake Michigan lies in a rock basin whose western edge is scarcely outside of the water basin or valley of the lake, and might possibly have through the rocks a trifling amount of water from outside of the valley. But west of that the general dip of the rock beds is southwestward from the neigborhood of that lake and of Lake Superior; and these beds, like one arm of a U tube, pass under a vast thickness of newer rocks that would be a water-tight covering; but do not rise to the surface in that part of the Rocky Mountains, and few, if any of them, ever came to the surface again anywhere in a westerly or southwesterly direction.

Besides, that Rocky Mountain region, so far from being a "great water producing region," has only a very moderate rain fall of about twenty five inches, or less, yearly; and it must be admitted that rain is the source of all rivers. The country is almost bare of trees, so that the drying up of the water is favored; and the sun is unclouded for months together. Altogether, it is hard to believe that "nearly all the great rivers of the west" are not quite enough to drain this region, without supposing hidden underground streams. But it must be borne in mind that the length and size of these rivers is not due to the great water producing capacity of this region, but to the fact that, owing to the height of the land here, and its distance both from the Pacific and Northern Oceans and from the Gulf of Mexico, rivers must flow in all directions towards these seas, must be very long, and, draining consequently each a very extensive region, must become large.

The fact of the disappearance of some streams in the great western closed basin, may be accounted for by the great evaporation of that vast region, together with its extremely small rainfall; so that it would be strange if any great amount of water were left at last to drain away either above ground or below.

The amount of water discharged by rivers must plainly depend in the main on the extent of country drained on the rainfall, and on the amount of evaporation. This last is dependent partly on the climate and partly on the shade of trees and other plants that hinder the drying up of the water. It is easily seen on the map that the extent of country drained by the water of Niagara Falls, few and small as the rivers are, is about as large as that drained by the Ohio and its feeders, including the Tennessee and Cumberland, and notably larger than that drained by the Upper Mississippi. The rainfall seems to be somewhat less than in the basin of the Ohio, but not much, if any, less than in that of the Upper Mississippi. For evaporation, the climate is perhaps rather less favorable than the climate of the Upper Mississippi, and decidedly less so there than the climate of the Ohio valley; but rhe evaporation may be thought to be rather favored by the wide unshaded surfaces of the lakes. Humphreys and Abbot, in their water survey of the Mississippi, found that, while the Ohio and the Upper Mississippi drained each twenty-four per cent. of the rainfall of their valleys, other great rivers, branches of the Mississippi, drained widely different portions of the whole rainfall of their basins, varying from fifteen to ninety per cent. It would seem, then, impossible to determine this ratio for the St. Lawrence basin above Niagara, except by the help of measuring the amount of water at the Falls; and it does not seem likely that the size of the river at the Falls is so thoroughly out of all proportion to the size of the Ohio at its mouth, or of the Mississippi at the mouth of the Missouri, as to require the supposition of any unusual underground feeders of the lakes.

It is then clear that, while some of the statements made in support of the theory of important underground feeders are quite mistaken, they are all very far from showing even its probability, to say nothing of proving its truth. So unfounded a theory, indeed, would not have merited such serious notice here, had it not been so endorsed, in the way already mentioned, as to justify the general public in believing there was something in it.

Written for the American Journal of Mining.

ON THE VENTILATION OF COAL MINES.—VI.

BY J. HARDEN, M. E., WILKESBARRE, PENN.

(Continued from page 162.)

Of the motive powers used to increase the ventilating current of a mine, the furnace is most generally adopted. In the deep pits of bituminous districts, particularly those of the northern and midland counties of England, its employment is almost universal; but it is somewhat doubtful whether such will ever be the case in the anthracite region, where its introduction must be preceded by a general recognition of the fact that wherever one shaft is required to win the coal, it is more advantageous to sink two, devoting one exclusively as an upcast to the ventilation, whatever be the auxiliary power employed. Hitherto the plan and position of the furnace seem to have been regulated by whim or prejudice or blind empiricism, without intelligent regard either to the principles of its operation, or the difference of conditions between one mine and another. It happens sometimes that an adaptation is seen which successfully answers the requirements of a special case; and, without inquiry into the particular circumstances attending the success, the idea is imbibed, that this is the very plan most advisable in some other case; but its application elsewhere, as might be expected, results in a disappointment which forethought and study would have prevented, by dictating the proper modifications of the original arrangement.

The fundamental principles upon which the use of the furnace in ventilation is based, are very simple.

We have before seen that, in natural ventilation, the current is produced by the difference in density of the downcast and upcast columns, due chiefly to the difference of temperature. The furnace is intended to increase this difference, by heating the air in the upcast shaft. To do this most effectually, the furnace should be placed immediately at the bottom of the shaft, and not away from it; and it should be so constructed, that a regulation of the return air over and through it, in the full area of its current, is practicable. It is necessary also to graduate the admixture of a current of fresh air, so as to stimulate combustion and generate the greatest heat, and in so doing produce the greatest amount of ventilation of which the furnace is capable. In other words, fresh (not vitiated) air is necessary to make the fire burn hotly, and the upcast current of the vitiated air of the mine must be exposed as fully as possible to the heat thus generated.

The foregoing are the principles to be borne in mind in the application and operation of the furnace, whatever be its plan of construction; but it is only in cases where a shaft is devoted solely to the use of ventilation as an upcast, that no impediment exists to their full application. With such a condition, the furnace may be placed so that the heated air may escape directly into the shaft, and the temperature may be increased at will. But when the upcast is only a division of a larger and single shaft, and that shaft lined with timber, and the division made with a brattice of timber, in some instances not more than an inch thick, the guide rods of timber also, it is absolutely necessary to set the furnace back, since the flame or sparks whilst firing, should not reach the shaft. This necessitates a long flue between the furnace and the shaft, in which much of the effect is lost, the temperature of the air being reduced, or absorbed, in the conducting power of the circumference of the flue drift, and the initial temperature of the column thereby lessened before it enters the shaft. It often happens, also, that water which is distributed over the surface of the brattice for its protection, scatters and falls over the area of the shaft and, besides counteracting the upward draught, robs it of its heat, while the numerous crevices in the brattice, by letting through the cold air, contribute to the same result; and these drawbacks are all in addition to the natural conduction of heat laterally into the sides of the shaft.

There are many varieties of construction for ventilating-furnaces. Some are left with a large area over the fire bars, that there may be as little obstruction as possible to the current. Others there are, wherein that space is purposely reduced, and the air forced through the fire. Others have the front part of the arch brought down to within a little distance of the fire, with the remaining space behind open and of the full size, to admit of the sudden expansion of the air immediately after its first contact with the fire. Others have the same space closed with doors. Others again are left open both above and below the bars, so that some of the air will go through the fire, but the greater part over it. Some have side drifts, and in pits where the return air has become so loaded with fire damp, that an explosion would be the consequence of passing the current over the fire, the return air course is made to empty itself in the upcast shaft, at a point above the furnace, and out of the reach of the flame, the furnace being supplied with a stream of fresh air direct from the intake or downcast shaft.

The choice of a proper construction depends generally on the nature of the strata surrounding the furnace, the current of air required for ventilation, the proportion of air carried over the fire or into the shaft, and the ratio of fresh air entering the upcast, when the return is excluded from the furnaces.

With air courses of sufficient capacity, a much larger amount of air may be passed over the furnace, than is required to meet the ordinary demands of anything I have yet seen in the United States. Yet, as before said, its powers are limited. To double the air-current, the difference between the temperatures of the upcast and downcast must be quadrupled. A furnace, the power of which is sufficient only to double the temperature of a current of twenty thousand feet of air per minute passing over it, cannot do the same for thirty thousand feet. Nothing is more easy, it is true, than, by narrowing the air return, to produce a high temperature of the upcast column; but this is accompanied with such an amount of friction through the narrowed space, as to produce no useful result, in the mine. It sometimes happens that the return air of the mine is so loaded with impurities that, fed by it alone, the fire does not get sufficient oxygen to keep up the necessary combustion. In such cases I have seen some good results from the introduction through twelve or fifteen inch pipe of fresh air from the downcast under the bars of the furnace, at the same time fixing doors to the ash pit.

Although in Great Britain, ventilation of a very high order is obtained by the use of the furnace alone, currents varying in volume up to more than two hundred feet per minute being circulated through pits, whose length of roads, cuttings, and courses vary from twenty to seventy miles, yet the same, or even satisfactory results, by the same means, cannot possibly be obtained in the slopes and shallow pits of this valley. There are seams of coal being worked, with depth of shaft enough to make an upcast column from the furnace; but with timber linings to the shafts, timber buildings and timber everything about them, its adoption in such cases would be most dangerous.

P. S. ERRATUM.—I have only just discovered that in the fourth article of this series, I am made to say, "In fact *these* methods allow a larger current than almost any other, and this is *their* chief merit." It should read, "In fact *this* method allows a larger current than *the other* and this is *its* chief merit." J. W. H.

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CHEMICAL REACTIONS IN THE ROASTING OF PYRITES.

BY J. H. TIEMANN, JR.

Ever since "pyrites" has been used in the manufacture of sulphuric acid, it has been frequently noticed that instead of the roasting chamber being filled with an invisible mixture of atmospheric air and sulphurous acid, visible white fumes arise from the glowing pyrites. This has been noticed more particularly in muffle furnaces, (where the pyrites is roasted in a chamber heated from the outside,) and especially in Spencer's muffles, which are fifteen metres long. It is hardly possible that this occurs only in muffle furnaces; its occurrence here is more readily perceived than in other furnaces—"kilns," for instance. These white vapors, as is known, are anhydrous sulphuric acid. The condensation of liquid sulphuric acid in the flues connecting with the leaden chambers, is undoubtedly owing to this cause. The fact that these fumes are frequently, if not always, formed, induced Mr. Fortman, at the laboratory of the Collegium Carolinum, in Brunswick, to institute a number of experiments on the subject.

The material used was a piece of nearly pure iron pyrites, with well-defined crystals, interspersed with quartz; analyzed in the ordinary way, it yielded 50.21 per cent. of sulphur. The pure pyrites Fe S^2 requires 53.3 per cent. sulphur. For all the experiments, the pyrites was reduced to a very fine soft powder.

The powder was placed in a hard glass tube ½ inch wide, which was placed in a Liebig's combustion furnace (the same as for an organic analysis), and brought to a red heat, while air was drawn through the tube by an aspirator. With careful and gradual heating, the point at which the pyrites ignites may easily be seen at the same moment with the first evolution of sulphurous acid; the white fumes make their appearance, and continue without interruption during the whole time of roasting. In the first experiment, the tube was connected with a flask containing a solution of caustic soda, and a tube with dry caustic soda between it and the aspirator. It was at once apparent that the white fumes passed through both absorbents into the aspirator; the absorption was, therefore, very incomplete, although all the sulphurous acid was absorbed. It is known that anhydrous sulphuric acid mixed with air or other gas, is very difficult to condense. It is, therefore, not surprising that in this case the white fumes were imperfectly retained; the quantity of the uncondensed portion (principally anhydrous acid) was remarkably large, as shown by analysis. 1.5 grms. of powdered pyrites were roasted; the dry caustic soda was dissolved in the solution of soda in the flask; this was oxidized with chlorine, and precipitated with chloride of barium, which gave 3.657 grms. sulphate baryta—corresponding to 33.49 per cent. sulphur. According to which, 16.72 per cent. of the sulphur in the pyrites was lost—as anhydrous sulphuric acid [50.21—33.49=16.72.] The roasted pyrites retained a small portion of sulphur at those points where it was in direct contact with the combustion tube. This evil was corrected by frequently turning the tube during the roasting, and the mass was heated gradually from the front of the tube towards the rear; in this way, a residue was obtained entirely free from sulphur, and of a bright red color.

In the above experiment, it was found that the dry caustic soda absorbed more rapidly than the solution; the soda tube was therefore changed for one three times larger, and the experiment again made, giving the following results: Roasted pyrites, 1.366 grms. The gases, as before, first passed through soda in solution, and then through the tube with dry soda. At the end of the operation, the soda in both was neutralized; the solution divided into two portions; one portion was immediately precipitated with chloride of barium; the other half was first oxidized with chlorine and then precipitated. The first gave 2.485 grms., the latter 1.986 grms., of sulphate of baryta, so that in 100 parts pyrites—

Sulphur, absorbed as sulphurous and anhydrous sulphuric acid, - - - - - - - -	48.39 pts.
Sulphur, absorbed as anhydrous sulphuric acid alone,	38.31 "
Sulphur, absorbed as sulphurous acid, - -	10.08 "

So that from 50.21 per cent. sulphur in the pyrites, 1.82 parts were lost by incomplete absorbtion (50.21—48.39=1.82.) According to which, the amount of sulphur eliminated as anhydrous sulphuric acid, was almost four times as great as that which passed off as sulphurous acid. An apparently unlikely result, especially when we consider that the insolubility of the sulphate of baryta in a concentrated solution, or an imperfect roasting of the precipitate, may have easily caused an error.

A more perfect result was expected by determining the sulphurous acid with iodine solution by the burette. In so far as the roasted pyrites retains more of the sulphur, and the sulphurous acid is entirely absorbed, this method must give a perfect way of determining the relation between the two acids. The anhydrous acid can easily be determined by the difference between the sulphur in the pyrites and in the sulphurous acid formed.

1.549 grms. pyrites was roasted, as before; all the caustic soda was united in one solution, and the solution was diluted to exactly 1000 cubic centimeters. 10c.c. treated by the well known method, required 1.75c.c. iodine solution (1c.c iodine solution = 0.00032 sulphurous acid); so that again, according to this experiment, the amount of anhydrous sulphuric acid is much greater than the amount of sulphurous acid.

These preliminary experiments, which will be continued show that the amount of anhydrous sulphuric acid formed in roasting pyrites, is very important, and much greater than has been supposed. They show further, that the amount varies, depending upon the temperature and other circumstances which are still to be investigated.

Translated for the AMERICAN JOURNAL OF MINING, from the *Chem. Centralblatt*, 1868, No. 2, page 28.

THE PROGRESS IN THE MANUFACTURE OF STEEL,

REPRESENTED IN THE EXHIBITION AT PARIS, 1867.

The manufacture of steel has increased very much during the last two decades. France has produced cwt. of:

	Puddled steel.	Cement steel.	Cast steel.	Bessemer steel.	Total.
In 1847	6,760	44,140	4,440	——	55,340
" 1857	227,350	172,056	113,134	——	512,540
" 1867	350,000	150,000	160,000	500,000	1,160,000

In 1867, therefore, France produced more than twice as much steel as ten years ago, which enormous increase is essentially due to the introduction of the Bessemer process; the increase from 1847 to 1857 is principally due to the introduction of puddling steel.

Also in England, Prussia, Austria and other countries, the Bessemer process has been introduced with the same great increase in the amount of steel produced; even Italy has now Bessemer converters in operation. In the United States several converters are in operation, particularly at Troy.

In France the iron is now usually run directly from the high furnace to the converter, as was and still is customary in Austria. Many castings, particularly of toothed wheels, requiring great strength, are now manufactured of Bessemer steel; such castings were exhibited both in the French and the Prussian divisions.

The weekly production of Bessemer steel may be estimated as follows:

					Per week.
England,	15	works,	52	converters	6,000 tons.
Prussia	6	"	22	"	1,460 "
France	6	"	12	"	880 "
Austria	6	"	14	"	650 "
Sweden	7	"	15	"	530 "
Belgium	1	"	—	"	100 "
Italy	2	"	—	"	— "

The greatest quantity (about two-thirds of the whole European production) and lowest price are attained in England; but in quality of the steel the Continent is fully equal to England.

At the Exhibition two new processes for the manufacture of steel were represented. The process of BERARD, a modification of the Bessemer process, has been tried at Montataire; its success is rather doubtful. The process of EMIL MARTIN has been practiced for more than two years; it is a production of cast steel without the aid of crucibles, a gas furnace with a Siemen's regenerator giving the necessary high temperature.

In the English division, BRUYS & Co., Sheffield, exhibited wrought iron fused in crucibles; tools made of this very uniform material are afterward converted into steel on their surface.

In Prussia the production of metals, and particularly of

steel, has of late very rapidly increased, as may be seen from the following table of the annual production:

	Total metals.	Of which iron.	Steel.
1860	47½ mill. thalers.	26 mill. thalers.	3 mill. thalers.
1861	49½ "	24½ "	5 "
1862	56½ "	28½ "	5½ "
1863	61 "	30 "	7 "
1864	71 "	33½ "	13 "
1865	79 "	35 "	15 "

G. H.

THE EOZOIC OCEAN.*

EDITOR AMERICAN JOURNAL OF MINING:

SIR—My essay upon gold-genesis, to which you have accorded a place in your columns, has, I am pleased to say, attracted, to a certain extent, the attention and criticism of other laborers in this same fertile and fascinating field—the field, I mean, of chemical geology; one of the sciences of the future, many sections of which are almost virgin soil, but which is destined hereafter to yield harvests to mankind second to none in the grand domain of science.

In my correspondence with Professor STERRY HUNT, the most eminent American intellect hitherto engaged upon this subject, he has made me aware of certain exceptions taken by him, both to some of my statements of views previously presented by himself, and to some of the new views presented by myself. It cannot but give me pleasure to be thus called upon to revert to these things; both because of the attention received from such a source, and from the hope of having opened new subjects for discussion—discussion, let me also hope, of that dignified and dispassionate character, which constitutes the soul of scientific progress.

I must give my first attention, of course, to those points wherein Prof. HUNT conceives that I have misapprehended his views, or failed to set them forth accurately; leaving the apparent point of difference in our theories for another communication. Therefore, as I am allowed, by consent of Prof. H., to quote from his letters upon this subject, I shall first lay before your readers the following passage:

"In your papers, which I have read over with care, I agree with very much. Your *five postulates* contained in your first paper I accept. Indeed I have repeatedly insisted upon, and as my hearers can testify, based my whole theory of metalliferous deposits (explained in my Lowell lectures last year) upon them. (See a brief report of the geology of the metals in the N. Y. *Tribune*, evening edition, of Feb. 15, 1867. You will find the same thing pointed out in a few words in *Silliman's Jour.* for May, 1861, vol. xxxi., p. 405.) So far we are quite agreed. You, however, say that I once maintained the theory of a Primeval Sulphatic Ocean, but have since abandoned it. I have never expressed but one view on the subject, which is that the primeval sea held all the chlorine and sulphur as chlorids and sulphates. Have I ever taught the contrary? My fossil sea-waters (except where they are bitterns) or locally modified by the introduction of baryta salts, always hold sulphates enough for the sulphatization of the metals. (Of course bitterns from waters holding excess of lime lose nearly all their sulphates by concentration, as gypsum, and chloride of calcium remains in solution.) Such was the composition of the Palaeozoic Lower Silurian ocean from the Lower St. Lawrence to the Ohio, and I cannot on general principles, conceive any other composition than I have ascribed to the seas at that time; nor have I ever expressed but one opinion about their composition. Excuse my insisting upon the point, as your readers will suppose I have changed my views, whereas I have for ten years constantly maintained the same opinion, and taught no other. My fossil sea-waters are no other than the waters of the primitive chloro-sulphatic ocean, more or less modified by evaporation, addition of carbonate of soda, reduction of sulphates by organic matter, etc."

I have sought diligently for a file of the N. Y. *Tribune* comprising the *evening edition* of Feb. 15, 1868; but find that not even at the publication office of this journal have the evening issues (discontinued in the course of 1867) been kept on file. Perhaps some of your readers can assist me here.

It is of more special interest now, however, to ascertain Prof. HUNT's views as promulgated *before* the reading of my Buffalo Memoir in 1866; and I present here, therefore, the paragraph of date 1861, which he refers to:

"The metals of the Quebec group seem to have been originally brought to the surface in watery solution, from which we conceive them to have been separated by the reducing agency of organic matter in the form of sulphurets, or in the native state, and mingled with the contemporaneous sediments, where they occur in beds, in disseminated grains, forming *fahlbands*, or, as at Acton, (Canada,) are the cementing material of conglomerates. During the subsequent metamorphism of the strata these metallic materials being taken into solution by alkaline carbonates or sulphurets, have been re-deposited in fissures in the metalliferous strata, forming veins, or ascending to higher beds, have given rise to metalliferous veins in strata not themselves metalliferous. Such we conceive to be, in a few words, the theory of metallic deposits; they belong to a period when the primal sediments were yet impregnated with metallic compounds, which were soluble in the permeating waters."

The close correspondence, in many respects, of these inductions with my own, is clear; and I would recall, indeed, that I stated at the outset emphatically that I "wished my first five postulates to be regarded as gathered, in substance, from the mass of facts and hypotheses comprised in the memoirs of the many great chemists who have devoted lives of research to chemical geology and geogony," specifying STERRY HUNT by name.

Still, I am obliged to suggest, that in its details my theory seems to me far broader and more comprehensive, as well as in closer analogy with actually extant and observed phenomena, than that conveyed in the above paragraph. Doubtless there have been circumstances and localities where *ascending* currents of heated waters from below, carrying mineral constituents, have been concerned in rock metamorphism, and in the filling of fissures with crystallized matters. This is an ancient view of vein genesis, the *general* applicability of which I was obliged to reject early in my study of the subject, for reasons, some of which I have already set forth; and I may recall here my argument against the probability of the almost universal veinstone, quartz, having been deposited from *saline* waters, and the necessity of bringing in the percolation through the heated mass of *fresh* distilled *atmospheric* waters, as set forth in my seventh postulate, as the main and fundamental agency in general crystallo-genetic, as well as metallo-genetic, metamorphism. The agencies of alkaline solutions I must regard as also but local and exceptional, or at least as superfluous in the majority of cases.

It is readily to be believed, nevertheless, that at the time of writing the above, much must have remained in reserve in the mind of Prof. H., which would, doubtless, have thrown much more light upon the theory conceived by him, had his statement thereof been less concise.

I am glad of the opportunity here occurring, to do justice to this eminent scientist, by stating that the great generalization of the agency of *organic bodies* in the reduction of metallic sulphides, which he has set forth in this paragraph; and which is the basis of my fourth postulate; is, I believe, entirely due to him; that is, in the broad and general application which he has given to it, and which he has repeatedly insisted upon in his writings. To this I shall return in my next communication.

The next point made by Prof. HUNT in his letter to me, as above quoted, is that I have mistaken and therefore misrepresented his views regarding the *sulphatic* character of the Eozoic ocean, which I have made the foundation of my theory. I have therefore carefully re-examined what he has previously written bearing upon this, and shall lay before your readers some written extracts next week.

HENRY WURTZ.

26 Pine street, New York, March 9, 1868.

* Professor DAWSON, in one of his papers upon the eozoon, has suggested that the rocks containing this fossil, formerly classed as Azoic, be known as the "eozoic formation." Regarding the suggestion as valuable, and the term as highly appropriate and expressive, I adopt it, and make a further application of it as above. H. W.

Mining Summary.

GOLD AND SILVER.

California.

Lake County.—Late accounts from the gold mines in the northern part of this county are encouraging. The *Courier* says: Three companies are now at work there, and judging from the preparations being made, they intend to stick to it. Other places in this vicinity give fair prospects, and gold in small quantities can be found in almost every ravine in this section of the country.

Napa County.—A very promising discovery of cinnabar has recently been made northwest of Pine Flat, beyond the Sonoma county line. It is reported that the true ledge is discovered.

Siskiyou County.—The Yreka *Union*, of Jan. 25th, says: All mining operations in the county have been suspended for several weeks on account of the severity of the weather.

Sacramento County.—We heard of a wash up in a mining claim in this vicinity a short time since, from which $4,000 was realized, says the Folsom *Telegraph*, Feb. 1.

Kern County.—The mines of the new El Dorado district, near Sageland, thirty miles east of Havilah, are yielding rich returns. An exchange says: The St. John company is now crushing ore from its mine continually, and the average yield is about $40 per ton. A fourth interest in this mine was recently sold to J. C. Birdseye for $20.000. An undeveloped mine, known as the Phœnix, in the same district, recently sold to Bridger & Kearney for $13,000.

Calaveras County.—The *Chronicle*, Feb. 8. says that in the Golden Gate claim an incline tunnel, 500 feet in length, has been run, and a lead of paying gravel 100 feet in width developed.

Amador County.—The Sulphuret mill at Sutter has been purchased by the former owner, S. S. Manor, and is now in operation, running on sulphurets obtained in that district and other places. The sulphuret works at the Coney & Bigelow mine are now in full blast, and work admirably. They are under the superintendence of Mr. Agrell.

Alpine County—We condense as follows from the Monitor *Miner* of Feb. 8th: The Lateral tunnel of the Monitor Consolidated company, now over thirty feet, already shows, among the decomposed substance in which it is running, ore which assays 20 to 30 dollars per ton.....MT. BULLION.—The property situated in Alpine district, just opposite the mouth of Monitor creek, has passed, with clear title, into the hands of London capitalists under the managing agency of Mr. Coulter, who intends pushing the tunnel into the mountain as fast as men and means can do it. Mr. Ray has found richly paying ore in a tunnel running from Monitor creek to open up the continuation of the Tarshish ore deposit south.....A shaft has been sunk on the foot wall of the Morning Star mine, and is now down over 80 feet. Water is easily kept out.

Nevada County.—The *Gazette* has the following interesting report of a recent visit to the Grass Valley mines. It says: In the early part of last season, the mines fell short somewhat of anticipations, but in the last four or five months the yields have been far ahead of what was expected. In company with J. K. Byrne, we rode over to New York Hill, where are located the works and mine of that name. Here we found John I. Sykes attending to the mill department; also John Trenberth, who has the general superintendence of the work. The new mill of this company is now doing excellent work, running night and day, and crushing 20 tons in 24 hours. In the mill they have one Knox pan, one Attwood amalgamator, two run of blankets, copper plates and an agitator. The skimmings are ground in the Knox pan. The mill has 10 stamps, and is arranged for 10 more, which, at the rate they are now raising rock, will soon be needed. During the month of January they raised 600 loads of rocks, averaging 1¼ tons to the load. The clean-up, after 3 days run of the new mill was $1,600, while a considerable amount must have been taken up by the new machinery. The mine has been opened to a fourth level, and a depth of 675 feet on the slope of the vein. The length of the drifts in level No. 1 is 400 feet; in No. 2.600 feet; in No. 3, 660 feet; and in No. 4, which are just commenced, the drifts will run 1,000 feet. The proprietors tell us that since Trenberth has been Superintendent, they have raised more rock and at less expense than ever before. At the North Star Mine we were received by W. H. Rodda, the Superintendent. He informed us that from the 1st of January to the 1st of February, they hoisted from the mine 1,200 tons of rock, which is yielding an average of $33 a ton. They have now four hoisting works in operation, three of which are entirely separate from the mill, and find it impossible to crush with their 16 stamps the rock raised from the mine, having now on hand, in front of batteries, some 200 tons. At present 150 men are employed in the mill and mine. The men are working by the day on contract, and on shares. Those working on shares, especially, are making money fast. We never saw better rock than that on the dump in front of the battery, and are satisfied that under Rodda's superintendence the present owners did not pay up to the full value of the mine. The sixth level, being at a depth of 865 feet on the slope of the vein, is the best ever opened, and the rock at this depth if crushed separately, would yield $60 a ton. The drifts on the sixth level have been run a distance of 300 feet, and the ledge, both in drifts and slopes, is well defined, and will average 18 inches in width. Twenty-four miners are at work in the sixth level, 42 in the 5th, 9 are at work sinking a shaft to the 7th level, which will be 946 feet on the slope of the vein, and the remainder of the force is employed in the upper levels. Five engines are used at the mine, which are run night and day, with the exception of 12 hours on Sunday, and 270 cords of wood are consumed each month. The sulphurets are worked by contract, partly at Hill's metallurgical works, and partly at the works of Petitjean. Those worked by Hill sometimes yield as high as $110 a ton. Six of Heady's concentrators have lately been placed in the mill, and Rodda says they are the best contrivance he has ever used for concentrating sulphurets. The concentrator, which receives the pulp from the amalgamating pans, saves half a ton of sulphurets daily; the other five, which take the pulp from the batteries, save a ton and a half daily. After leaving the concentrators the pulp is run through riffed sluices and reservoirs a distance of 3 000 feet, and about 60 tons of sulphurets are saved monthly by the company. But they do not get all that is contained in the rock, for, after running through the sluices, the tailings are sold to parties who work them over again, and are said to make money.....EXCELSIOR.—The Virginia *Enterprise*, Feb. 8th, says: It is said that the snow is now from 15 to 20 feet deep in Meadow Lake. The only communication between the town and the outside world is by means of snow shoes. There are only some thirty or forty persons now stopping in the town. None of the mining companies in the district are doing anything at present, except the Enterprise and Mohawk and Montreal companies. Both these companies are working their mines vigorously.

Nevada.

The Comstock.—From the San Francisco *Commercial Herald's* Market Review for the ten days ending Feb. 16, we extract the following items of news: The bullion sent to this city during the month of January, through Wells, Fargo & Co's office at Virginia, amounted to $440,772 10.....During the past week the stock exchange has been the arena of a most interesting financial duel, the apple of discord being the Hale & Norcross mine, for the controlling interest in which the struggle occurred. The settlement of this affair is a question of ammunition, the heaviest metal and the greatest amount of it being likely to come off conqueror, unless some amicable settlement be made. The two contestants appear to be nearly equally balanced in point of stock. The few stray shares, some eight or nine, held by other parties, have been bought up at something like three and four times their actual value by the contestants. The election for officers of the Hale & Norcross is to take place on the 11th of March, and the greatest amount of stock will decide who shall be the Directors. Three shares, held in New York, were sold by telegraphic order, and brought $7,100, last Thursday. The "shorts" may come to time when called, but if they throw up the sponge the cry will be, "stand from under.".....CROWN POINT.—The total receipts of bullion in January amounted to $54,249, and the expenses during the same period foot up $29,200, leaving a gain of $25,000. On the 8th inst. they had about 600 tons of ore ahead of the mill. On the 10th ceased extracting ore, for the purpose of repairing shaft and replacing pump, which, it is thought will require about three weeks.....HALE & NORCROSS—Produced a remarkable activity in the market during the past week, and the stock ran up to a very high price, which is more fully commented on above, but the records of the Board show the highest price obtained to be $7,100. We learn that no connection has yet been made between the 900 and 780 levels, but that it will soon be accomplished. Upon the whole, the improvements in the several drifts continue to look well, being about the same as previously reported. No assay certificates of the ore recently sent to the mills have yet been received at the office in this city, but will, it is confidently believed, yield from $40 to $45 per ton, as before stated. At the close, one share sold at $2,700 seller 45.....SAVAGE.—The bullion receipts in January aggregate $151,400 against $194,000 in December. This company, at the close of the month, had 3,224 tons of ore at the mills, valued at $118,131, and at the mine 351 tons, valued at $12,865—total, 130,996. Deducting cost of reduction, $53,055, leaves a net product of $77,941. The reclamations on mills, &c., will swell the total assets to $86,076. After deducting the dividend of $5 per share, payable since the 15th inst., a surplus of $63,000 remains in the treasury. During the week ending Feb. 8th, 1,601 tons of ore were extracted from the mine, showing an aproximate value of $53,487, or $33 37 per ton.....KENTUCK.—.....The receipts of bullion in January have amounted to $74,278, with the last clean-up to hear from, which is estimated at $20,000, making the product about $94,000 for the month against $98,296 in December. On and after the 15th inst., a dividend of $13 per share is payable to the stockholders.....CHOLLAR POTOSI.—During the seven days ending Feb. 6th, 300 tons of ore were extracted, showing an average car sample assay of $38 per ton. At a later date, the assays of ore from the old Santa Fe level ran considerably lower. Quartz, but no metal, is found in the drifts going south on the track floor of the 352 level. The sinking of the new shaft progresses favorably. On the 10th inst., 89 tons of ore were shipped to the Ogden and Kelsey mills. An assessment of $50 per share was levied upon the capital stock of this company on the 10th inst.....IMPERIAL.—The first returns of the month of February show a bullion product of $13,417 against $10,263 same time in January. From the Alta mine about 65 tons of ore are daily extracted. It is stated that the ore from the 150, 230 and 371 levels looks well, especially the 371 level. Both mills are in good running order, and fully occupied. At present the roads are good, and about 80 tons of ore per day are taken to the Rock Point mill and twenty-five to the Gold Hill mill. At the close, we are informed that a new body of ore, said to be worth $33 to the ton, was found 200 feet west of the shaft on the south line, and 180 feet from the surface.

Quarterly Returns of Bullion in Nye County.—The returns from mines which produced bullion in Nye county during the quarter ending with last year, as published in the Belmont *Reporter* of the 15th ult., are of a highly encouraging character. Different districts in the county produced the following amounts of ore: Twin River, 1,091 tons, averaging $182 54 per ton; Silver Bend, 613 tons, averaging $55 77; San Antonio, 158 tons, averaging $108 79; Union. 186 tons, averaging $124 13; Hot Creek, 112 tons, averaging $138 76; Reveille, 62 tons, averaging $203 43; Morey, 97 tons, averaging $160 04; and Montezuma, 1 1-4 tons, averaging $432 per ton. The whole number of tons worked in the county, continues the *Reporter*, was 2,325, which averaged $136 93 per ton and yielded the sum of $318,423 31 in currency. The product of the Murphy mine, in the Twin River district, amounting to 1,080 tons, averaging $181 97 per ton, is very remarkable. The mine is hardly opened, the deepest working not exceeding 200 feet. With the exception of Silver Bend, the average yield of the ore produced in all the districts is high. The ores of Silver Bend, which are undoubtedly of superior quality, were treated without roasting, by which process we are satisfied that they did not yield 30 per cent. of their silver. It

will be safe to hazard the judgment that before the expiration of the present year the valuable ores of that district will produce an average of upwards $125 per ton. As it is, the returns of the last quarter are encouraging.

Reese River District—The Timoke is producing extraordinary ore from its deepest workings. The *Reveille*, Feb. 8, says: The assay of the pulp of two tons which have just been reduced at the Manhattan mill, gave a yield of silver exceeding $1,000 per ton. Apparently the ore is improving as depth is attained. .....The same paper says that the Florida mine has sent seventy tons of ore to Murphy's California mill for reduction, the average yield of which will exceed $300 of silver, coin valuation, per ton. This fine ore was extracted from the lowest level, which is four hundred feet on the incline.....Ore of a peculiar quality has been developed in the Diana mine. A competent judge has estimated that it will yield in the mill not less than $1,000 of silver per ton.

Silver Bend District.—Besides the operations on the Highbridge, Transylvania, El Dorado and Arizona, the chief and most fully developed mines in the district of Silver Bend, we learn from the *Reporter* of the 22d ult., that several other locations give good promise of turning out to be valuable mines. About four miles northwest from the town of Belmont is situated the Highland Chief, showing a ledge six feet wide, which produces lode of a high grade. A short distance west from the Arizona is the Belcher, upon which the owners are sinking an incline, and which yields excellent ore. Two miles south of the Highbridge is the Webster, estimated to be thirty feet wide. The owners have just completed an open cut, in which they uncover the ledge at the depth of twenty feet. This claim is believed to be a continuation of the Highbridge vein. A number of other claims are receiving attention, and in the spring they will be worked with vigor and probable success. On the assured mines of the district, such as the Highbridge, Transylvania, El Dorado, and Silver Champion, active operations are in progress. The *Reporter* says: "Now that the lawsuit with Kalmes is settled, we suppose the Silver Bend company will commence work upon an extensive scale. The Combination company's steam steam hoisting works will be completed in two or three weeks, when a larger force can be employed in their mines than at present. The indications are that the advancing season will be one of uncommon activity at Silver Bend, and that its product of bullion will be large and increasing before the expiration of the year. Two such veins as the Transylvania and El Dorado are sufficient to render the district of the first importance.

Miscellaneous—From the files of the Austin *Reveille* and Belmont *Reporter* to Feb. 22, we condense the following news items: J. W. Crawford, the builder of the five-stamp mill for the Monte Christo company in the district of White Pine, expects to have it completed and ready for working in about ten days. The works are favorably situated on the southwestern slope of the mountains, at a point known as Beard's Spring. They are taking out ore from the Hidden Treasure ledge, which is said to be of very high grade. There is little or no work done outside of the operations of the company.....The assay office of the Combination company commenced smelting on the 14th Feb. Up to the 21st—the first week—it turned out and shipped bars of refined bullion weighing in the aggregate 1,592 pounds.....The mill of the Twin River company in Ophir canyon, which has been closed several weeks for repairs, has been re-opened. It will continue to run steadily, until foul weather interrupts the supply of salt, of which article the mill is short.....Charles Schenck reports the discovery of a new district in southeastern Nevada. He says: "The prospectors made the discovery of sixteen lodes of astonishing size—the smallest one being almost 16 feet wide, and the biggest about 150. All of the lodes which they discovered can be traced for hundreds of feet, and the rock is certainly none of the poorest. The country rock in which the veins are imbedded is granite. Wood and water exist in abundance, water being within a quarter of a mile from the centre of the veins. Robinson district is the name of the newly discovered place. Robinson and his friends are now working their promising lodes. The district is situated about 100 miles from Egan, in a southwesterly direction, somewhere near the course from Egan to Hot Creek."

Montana.

"Now that Mr. Esler's enterprise has proved an entire success, it is the intention," says the Virginia City *Democrat*, Feb. 15, "of divers others to take hold of silver mining to an extent and with an earnestness that will ensure the development of the rich silver mines of Rattlesnake, and other districts in the territory. Mr. Esler, on inspection of some of the argentiferous ores found in this immediate vicinity, pronounces them rich and of a character that will yield very profitably if worked by the simple process he uses. In Mill creek district, parties owning silver lodes there are preparing to erect furnaces in the Spring, and work them upon Mr. Esler's plan. In Brown's gulch, a few miles from this place, where the Almeda, Loraine, and other rich silver leads are located, it is proposed to erect furnaces as soon as the weather will admit. Indeed, the experiment at Rattlesnake has proven that all the silver-bearing ores, to be found in this vicinity, at Argenta, Silver Star, Mill Creek, and at the head of Boulder Valley, can be easily worked at little expense, by working with them the galena ores, to be found in all of these sections. In view of the comparative trifling cost of one of these furnaces, there is no doubt that nearly every one owning silver property will make an experiment in the coming season similar to that of Mr. Esler's.....In connection with Mr. Esler and his works, the Virginia City *Post*, of Feb. 15, says: "A. M. Esler brought to town Monday, thirteen hundred pounds of lead and about one hundred and twenty-five pounds of auriferous silver, produced from the mines of Argenta, reduced and cupelled at his furnace. The lead is in bars, and the silver in the shape of a huge fractured button. Mr. Esler appears to have succeeded, not in any new process, but in successfully applying the old German and Mexican treatment to our argentiferous galena. His enterprise is individual, and entirely independent of any company. He claims no credit, save, perhaps, what may be due to industry and economical management. The machinery is cheap and simple. The ore is abundant, and will work, in Mr. Esler's opinion, over one hundred dollars per ton. The expense of smelting and cupelling the 125 pounds of bullion now in bank, did not exceed $600. The value exceeds $3,000.....Prof. Aug. Steitz, recently from the Flint creek country, reports in the Helena *Post*, of the 22d ult., as follows: "The St. Louis & Montana Mining Co. are actively engaged in pushing forward work on their lead property, with indications that are in the highest degree flattering. Their mill has ere this started up again, and will be kept in permanent operation in the future, if no unfavorable accident should occur. The works of Messrs. Rumley & Co. are also in active operation, and a large return is confidently anticipated from their first clean up. A great deal of activity prevails in developing lead property in that neighborhood. Cable City promises to equal if not exceed Philipsburgh, both in point of population and richness of the leads. Plaisted & Knowlan's mill had got into successful operation, and was running steadily on ore from the Atlantic Cable lode. It was the intention to clean up sometime during the past week, when a large chunk of retort was counted upon. An active and remunerative season's work, both in quartz and placer mining, in the section of country lying to the west of us, is confidently looked forward to. And if the lodes are as rich as they are represented to be, together with the new discoveries lately made in gulch diggings, there is no good reason why it should not be the most successful mining season which the territory has yet had.....The same paper has the following items of news: Another company had been organized, who propose to erect a furnace at or near Brandon. Messrs. Livingston, Bower, and others, are the corporators. They have entered into articles with Messrs. D. W. Morrison & Crowder to have a furnace in successful operation by July 1st. Work will be commenced at once. It is proposed to call it the Mill Creek Silver Smelting company. .....Mr. Creigh, of the Union City Mills, states that they have penetrated through the cap and now have what is probably a pocket, with a large quantity of rock in sight. The vein is six feet in width, and the foot wall has not been reached. Full shifts of hands are engaged, and are taking out large quantities of ore, and we may expect good returns from the Union mills..... Col. F. C. Deiming has just let the contract for completing the tunnel to tap the John How lode, to Messrs. John Martin and John Carther. The tunnel is now 253 feet, and it is estimated that in about 125 to 150 feet the lode will be reached. The work commences immediately.....Mr. Thomas panned out 100 pounds of decomposed quartz, from the Granite Mountain lode, situated near the head of Tucker gulch. $27 in coarse gold..... We take the following from the Deer Lodge City *Independent*, Feb. 22: The William Nolan mill started up at Cable City on Tuesday last under the most favorable auspices. The machinery worked well, and fully answered the expectations of the builders. An individual from that place offered to bet heavily, during the week, that the first clean-up would exceed $10,000. The same confidence exists among all from that section, and we may look for a good report from that quarter.....A stampede broke out in this place on Wednesday night, for some new diggings said to have been discovered about twelve or fifteen miles southwest of this place, in a gulch between two streams known as Lost and Modesty creeks. It is said to be dry diggings, and prospects about one ounce to the hand. We trust the stampeders may realize their expectations without having lost any modesty..... John Higgins and Daniel Kuhler have discovered rich silver quartz on the Bitter Root. It has created quite an excitement .....And from the Virginia City *Democrat*, of same date, the following: Several companies have organized with the view of erecting furnaces in Mill Creek district to work the rich silver ores of that region. Already work is commenced upon one furnace by Gov. Smith and those associated with him. Their furnace is being erected at Brandon, and will be in full blast before the 1st of May.....If reports from Silver Star district be correct, it bids fair to carry off the palm. Messrs. Tivits & Bates who have but recently started their twelve-stamp mill, it is reported, have cleaned up $7,500, the proceeds of six days' run. We fear this report is too good to be true. Yet it is known that some of the richest ores, gold and silver, to be found anywhere, come from this district.....A correspondent writes from Sterling, Feb. 17: "Business is dull at present, owing to the six mills being closed for want of sufficient quantity of rock on hand to keep them running."

Dakota.

We are in receipt of a copy of a newspaper called *The Sweetwater Mines*, bearing date Feb. 29, published at Fort Bridger, U.T., near the mines from which it takes its name. Concerning the mines and their prospects, a correspondent writes as follows: The Bridger Company's Atlantic Ledge shaft is now down about sixty feet, showing the same character and pay rock as that seen at the point where they cut the vein. The vein at the bottom of the shaft is even wider than at any point above, showing good, well-defined wall rocks, and pitching slightly to the north. In my judgment this claim is far superior to the famed "Haywood Gold Quartz" claim, Amador Co., Cal. It certainly, so far as prospected, gives a much richer result in the precious metal. The Bridger Company may well feel proud of their claim. Great credit is due to Mr. Jack Temple, the able superintendent of the mine, for the manner in which he has so far prosecuted the work of development. The Hope Company, on the same ledge, suspended operations, for what reason I am unable to say—whether it is for lack of funds or cold weather. The Col. Lewis Company have erected a house over their works on the Atlantic extension, and are determined to drive the work of development in a systematic and business-like manner. As the owners are military men, I imagine they will never surrender until they capture the fickle goddess—Fortune. They are determined to fight it out on that line if it takes all summer. A new district has been formed out of a portion of Shoshone and California districts, called the "Kentucky Gold and Silver Mining District," and Mr. C. North elected Recorder. In this district are situated the Emerald Isle, Lone Star State, Kentucky and Old Virginia. The miners of this district have gone to work in right earnest to develope their claims, in order, as they say, to show the outside world that the Sweetwater mines are no myth, but a living reality. Two new discoveries have been made in the Kentucky district—one called the "Missouri," the other the "Roxeline." The former shows a vein of five feet in width, in which free gold is visible to the naked eye, the latter prospects well in the yellow metal.

Idaho.

Advices from Silver City to Feb. 22, run thus: On the 17th inst. work was stopped on the Oro Fino mine, and all the hands discharged, except enough to continue the shaft in the north works. The principal cause of the suspension is the great disadvantage under which the company have labored in not having steam hoisting works. Mr. H. Gove has started for Virginia City, Nevada, for the purpose of procuring an engine and other necessary machinery, which it is estimated will arrive here in thirty-five or forty days at most. At the same time material will be brought up for repairing the Morning Star mill, which is considerably out of order.....At the Woodstock quartz in considerable quantities is being taken out, but will not be crushed till spring, when the mine will furnish enough ore to constantly run fifteen or twenty stamps.....Wells, Fargo & Co., on the 15th, dispatched below from their office in this city, per the railroad stage, bullion worth $52,000.....From Northern Idaho we have the following intelligence to the 1st ult: At Warrens the Hic Jacet mill is running well, and can crush eight tuns of rock per day. The next crushing will be thirty tuns of the Sampson ore, and afterwards about thirty tons of the W. B. Knott, and then about twenty-five tuns of the Scott, nearly all of which is now extracted from the veins. The pioneer mill will start again sometime this month. Captain Williams is building a furnace.

Minnesota.

The Vermillion Lake Mines are to be further tested during the coming summer by Col. Tyndall, in the employ of the different mining companies therein interested. $2,200 has been raised to further the project, and it is thought there will be no trouble in securing as much more. The Superior (Wis.) *Gazette* of the 7th inst. says that the plan to be pursued is a simple and sensible one. Col. Tyndall is to proceed to the lake, and by the aid of the machinery now there belonging to the New York company, in conjunction with what he may carry with him, he will make working tests of the veins belonging to all who may contribute to the general fund. Tools for mining are in the district, and all that is required is a force of some ten or twelve men with provisions sufficient to keep them some six or eight months. By this plan during the coming summer, the question as to which veins will pay and which will not will be satisfactorily determined.

Arizona.

From the Prescott *Miner* of Feb. 8, we condense as follows: Judge Brooks and Mr. Miller, who together own and work a claim in the recently discovered gulch, four miles south of Prescott, found a piece of pure, solid gold, weighing exactly fifty-eight dollars and fifty cents, allowing seventeen dollars for the ounce. Besides this piece, they took out on the same day finer gold to the amount of nineteen dollars .....Wm. S. Little and Edward G. Taylor, on Tuesday last, purchased for the sum of three thousand dollars, from Herbert and Nathan B. Bowers, the Placer mining property known as the "Excelsior Ditch and Mining property," situated on Lynx creek, about seven miles east from Prescott .....The upper tunnel in the Eugenie lode, Big Bug district, is now in 106 feet.

Arkansas.

A correspondent writing from Fayetteville, Ark., says that the discovery has been made of a very rich lead mine, about sixty-five miles from that place, in Newton county. The vein is said to be of the richest kind, and some very fine specimens have been taken out. A company has been formed, to work it under the name of the Great Western Mining company.

The Precious Metals.

The following interesting considerations respecting the supply, demand and relative value of the precious metals, and their influence on individual and national wealth, are contained in the recent report of J. Ross Browne to the Secretary of the Treasury, on the mineral resources of the States and Territories west of the Rocky Mountains:

WHY GOLD AND SILVER ARE USED FOR MONEY.

Gold and silver were adopted as standards of value long before the beginning of the historical era, and their fitness for money was evident even to barbarians. They are hard, and not subject to oxydation, and therefore they can be kept and handled with comparatively little loss. They have a brilliant lustre suitable for articles of ornament; and the peculiarity of the lustre, color, and high specific gravity renders them easily distinguishable from other substances, and makes imitations difficult. They are fusible and malleable, so that they can be made into any form, or stamped with any impression, and the hardness will protect the form or impression from wearing out. Both metals are found pure, so that savages would become accustomed to their use before learning to smelt the ores of iron, copper, and lead. Both metals are rare, and thus a small quantity has served to represent a large value of other articles; and wealth in the form of gold and silver could readily be concealed or transported from one country to another. There are other hard, rare and lustrous metals, but they cannot be readily refined, or their lustre is not peculiar, or the supply is not regular, or they have no recognized value in the arts; and thus gold and silver are to-day, as they were five thousand years ago, the best of all metals for the purposes of money.

A GREAT INCREASE OF PRODUCTION PROBABLE.

A great increase in the production of both gold and silver is probable. In California, Australia and Siberia gold mining is now conducted under many disadvantages. In the two former, wages and interest are exceptionally high, and in all there is a lack of that thorough knowledge and of those economical modes of working which can only be adopted by a generation educated to the business and devoted to it as a life-long occupation. In Spain and Brazil, which were once very rich in gold, and would probably pay for hydraulic washing, there must be numerous quartz veins that are now untouched. These will be made productive. The Andes and the Altai will be explored with care, and hundreds of veins as rich and large as those of Potosi and Guanajuato will be found. Machinery will be improved so that tunnels or adits large enough for wagons can be bored five, ten, or twenty miles long, through high mountains, so as to pay for purposes of travel, and at the same time any lodes that may exist in the chain will be opened to a depth far below anything known in mining. The great lodes of the future will not be discovered by such antecedents as those which revealed Potosi, Cerro Pasco, Sombrette, Chanarcillo, and the best mines of Catorce. If veins like those could be found by chance, what will not the well-directed explorations of the future find? It is scarcely to be doubted that a large tunnel, commenced 1,500 feet above the sea level, on the western slope of the Sierra Nevada, at any point between 36 degrees and 40 degrees, would in the course of ten miles run through a multitude of rich lodes. We have reason to believe that when the great mountains were formed numerous large fissures, running in some places for hundreds of miles, were filled with auriferous and argentiferous quartz; and we fail to find them not because they are not there, but because they are covered with earth, and because the clambering hunter, the benighted wanderer, or the charcoal-burner does not pull up the bush or does not light the fire in the right spot. A tunnel running through the Andes, commencing near Lima or Santiago would reveal wonders; and the progress or mechanical industry is so marvelous that we are justified in hoping, if not in expecting, to see immense tunnels, fifteen or twenty miles long, cut through high mountain ranges.

THE RELATIVE VALUE OF GOLD AND SILVER.

It is impossible to ascertain now when or how the difference arose between the market value of the two metals. It may be seen that they are almost equally suitable for the purposes of money. Gold has a higher specific gravity, and is susceptible of a higher polish; but the difference in these respects is not great enough to cause a difference of fifty per cent. in the value between them. There is reason to doubt whether the relative values were ever proportionate to the relative supplies. We have no precise information about the supplies before the beginning of the sixteenth century. At that time an ounce of gold was worth eleven and fourteen ounces of silver. In the course of three centuries previous to 1800, the stock of the precious metals in Christendom had increased $5,890,000,000; of which two-thirds in value and ninety-six per cent. in weight was silver; so that if the value of the two metals had been proportionate to the supply, one ounce of gold ought to have been worth thirty of silver in 1800. Notwithstanding the immense production of silver in the eighteenth century, the relative value of the two metals was precisely the same in 1816 as in 1717; and notwithstanding the vastly greater relative production of gold since 1849, the relative values have scarcely changed. We observe, too, that although gold is very scarce in India and Asia, it does not bear so high a price as in Europe. The mere fact that gold is worth fifteen times more per pound than silver makes a demand for it, because it is so much more convenient for use.

Although the values have not been regulated strictly by the supplies, it is certain that they have been affected by them. In consequence of a great increase in the supply of gold during the life of Julius Cæsar, an ounce, from being worth seventeen ounces of silver, fell to be worth only nine.* And in the last three hundred years gold has risen relatively more than thirty per cent. in value.

The importation of silver from the silver producing countries into Great Britain, and the price per ounce of bar silver in Lon-

* Chevalier, p. 110.

don, at various times since 1848, are shown in the following table:

Years.	Ounces.	Shillings per oz.
1848	17,337,226	59⅛
1849	20,186,600	59⅛
1850	14,715,247	60
1851	16,304,403	61
1852	18,848,521	60⅝
1853	17,421,714	61½
1854	16,797,442	61½
1855	14,868,935	61½
1856	17,041,761	61⅜
1857	16,798,163	61⅜
1858	9,017,458	61⅜
1859	11,909,246	62 1-16
1860	16,624,696	61 11-16
1861	19,954,001	60 13-16
1862	20,828,538	61 1-16
1863	———	61½
1866	———	62

It was expected, about 1853, when the permanence of the California and Australian gold mines was no longer a matter of doubt, that the relative value of gold would soon fall at least as much as it had risen in the sixteenth century, but this expectation has not been realized. It is impossible now to foresee or to form any very confident opinion whether gold will fall in value as compared with silver, if the present relative production is maintained. Chevalier contended, in 1867, that if it were not for the fact that France, since 1850, had been changing her currency from silver to gold, the latter metal would have fallen greatly in value, and he called France the parachute of gold.* From 1850 to 1857 the French mint coined $540,000,000 in gold, or an annual average of nearly $80,000,000, while, for forty-five years previous to 1848, the annual coinage of gold had been only $4,450,000. His argument would seem to be that, as soon as a gold currency had been substituted in France, gold would fall; but since 1857 enough of that metal has been poured into Europe to supply nearly all the nations with gold, and still there is no noteworthy change in relative value. There is such immense demand for ornaments and table-ware made of the precious metals that a long time must elapse before it can be supplied. We must expect, too, that at no distant time Asia will use gold extensively for currency, and, in fact, it has already commenced to do so. We consider it entirely useless to endeavor to predict the relative value of gold and silver in the future.

The financial and commercial history of the world during the last ten years does not establish Chevalier's idea that gold, as related to silver, will soon commence to fall in proportion to the excess of its production. According to his theory, the fall should have commenced already. In the ten years that have elapsed since he wrote, $1,200,000,000 have been added to Christendom, more than enough, if his estimates were correct, to overstock the market. But the market is not overstocked, as we know, from the fact that the price is not changed. It is undeniable, however, that the market would soon be overstocked in Christendom if there were no outlet, but there will be an outlet. Gold, except for purposes of small change, in sums less than two dollars and-a-half, is for more convenient than silver, and is preferred for most of the purposes of coin; and that preference will extend to Hindostan and China so soon as we have no more silver to spare. We have an excess of silver or we would not ship so much away; and so soon as we have no longer an excess, just so soon the European and American merchants in Asia will tell their customers there that they must take gold in payment. The more intelligent Chinese see the great advantages of a currency of gold coin over a bartering of silver bars, so the more precious metal has already come into considerable use; and those Asiatics who have done business in California and Australia will help to make the change. If it could be proved that all the gold must be confined to Europe and America, while Asia should continue her demand for silver, then a great fall in the relative price of gold within a brief period would have to be admitted, but that proof cannot be furnished.

Some fluctuations have taken place in the relative value of the two precious metals, within the last ten years, but they are too slight to furnish a basis for conclusions of any importance. The coinage of all the leading nations fixes the comparative prices in such a manner that no change can occur without overcoming obstacles which did not exist two hundred years ago. Throughout Christendom the governments and merchants say that one ounce of gold shall be worth fifteen of silver; and, to prevent any question about the precise relation, coins of both metals are in universal use, with a conventional value. The value is conventional to a great degree; we know that it does not bear any precise proportion to the supply. If the value is now conventional, why should not the conventionality stand? A change in such a matter necessarily implies loss and inconvenience. The present relative prices of the two metals are very well suited to the wants of commerce. We can pay large sums in gold without overloading a man; we can pay small sums in silver with coin not too small to be handled or carried in the pocket. It would be very inconvenient to have all our coin of equal value per pound: for then large sums would be burdens, or small coin would be too small for our fingers. In fact two metals are hardly enough, and so copper and brass have been used for coinage by most civilized nations in addition to the precious metals.

Chevalier† says: "Nobody can say that some day silver may not also undergo a great fall, brought about by a production which should be distinguished by the two following characteristics; of being much greater in comparison with the employments to which it had hitherto been applied, and of being applied and of being produced under more favorable circumstances; that is, at a less cost per kilogramme for the metal obtained. There are stronger reasons for thinking that if the United States annexed Mexico, and penetrated further into the regions of Central America, this event would not be of tardy accomplishment, under the auspices of a race so industrious and so enterprising as the Anglo-Saxons."

HOW INDIVIDUALS ARE ENRICHED BY MINING.

The first effect of the production of the precious metals in rich mines, is that it enriches the individual engaged in mining—or at least gives him an opportunity to enrich himself. A large proportion of mankind are so stupid, so imprudent, so wasteful, or so indifferent to the value of money, that they cannot make money when they have the best of chances, or keep it after they get it. The wages of miners are higher than those of other laborers; and when the miners are very rich the proprietors become possessed of immense sums. In the mining districts nearly every man, when he goes out walking over the hills, keeps a look-out for "indications," in hope of finding some vein that may make him a millionaire. The poorest white laborer in California working by the month gets a dollar a day besides board, and as the French or German laborer gets less than fifty cents a day, the Californian can, with his earnings, hire two Europeans to work for him, or he can purchase as much as two can produce, or he can afford to consume as much as two European laborers do. He wants their merchandise and they want his gold; so he exchanges one of his day's work for two of theirs. In this way he may live rich, even if on account of his extravagant habits he does not die rich. But the disproportion between wages in California and Europe is still greater in other occupations. The average pay of laborers, and the average profits of business in California are from three to five times as great as in continental Europe for labor or business of the same kind, and the difference represents a tenfold profit. If it costs seventy-five cents per day to live, the man who gets one dollar per day can lay by capital twice as fast as the man who makes only eighty-seven and a half cents. If the laborers of California had lived during the last seventeen years with as little unneccessary expenditure as the laborers of Germany, there would scarcely be a man among the old residents without his thousands.

HOW NATIONS ARE ENRICHED BY MINING.

The second effect of the production of the precious metals is to enrich the nation which possesses the mines, or to give it an opportunity to enrich itself. Nearly all mining districts are poor, although they consume luxuries which can elsewhere be afforded only by the wealthiest. The finest silks and the most costly wines went to Virginia City during the great bonanza in 1862, and similar extravagance had been witnessed before at Potosi, Cerro, Pasco, Guanajuato, and Zacatecas. The owner of a rich mine cannot dig out the pure precious metal with a shovel unassisted; he must employ a great number of laborers, and his money runs all through the community, and stimulates every branch of industry. The whole nation feels rich, and it purchases for one day's work the productions on which other nations have spent two days. The gold and silver are sent abroad to purchase those things which can be made cheaper abroad, where labor has not felt the stimulus. If the mines of California and Australia had not been discovered, labor would now be much cheaper in the United States than it is, and we should manufacture at a profit many articles for which we now depend exclusively on importation.

HOW THE PRECIOUS METALS FALL IN VALUE.

The third effect of the production of the precious metals in large quantities is that the prices of other articles generally are affected. We want gold and silver for coin and for use in the arts; and the smaller the supply the higher the relative value. The experience of ancient as well as of modern times has proved this principle. After Alexander conquered Persia and enriched Greece with the spoils of Asia, three times as much silver was required to pay for a day's work as before; and now it requires in average years six ounces of silver to purchase as much wheat in Europe as could be bought in 1490 for one ounce. The cause of the change is the great relative increase in the supply of silver, while there is no relative increase in the supply of wheat. The result of the great yield of the silver mines of Peru and Mexico in the sixteenth century was that between 1550 and 1600 wheat trebled in price. The production of the sixteenth century was about $690,000,000; whereas the production of $5,000,000,000 in the eighteenth only added fifty per cent. to the price which wheat bore in 1600, but more than two hundred per cent. of the price which it bore in 1500.

When we compare ancient with modern times, we see that the rise in prices were very much greater relatively in Rome after she became mistress of the world than it has been in Northern Europe since the mines of America, Australia, and Russia have yielded their treasures. The difference is owing partially to the fact that a large portion of the laborers in the Roman empire were slaves, and the number of those who used money and could possess plate was comparatively small, and civilization was confined to narrow limits.

The decrese of prices was less in proportion to the production of the precious metals in the seventeeth than the sixteenth, and less in the eighteenth than in the seventeenth, because business has increased with much greater rapidity in late times than before. Commerce, manufactures, and intelligent agriculture have grown wonderfully. Many branches of trade, conducted mainly by barter several centuries ago, are now managed exclusively with money. The laborers are all free, and each needs a stock of coin with which to make purchases in case of necessity. The use of silver table-ware and of gold ornaments is very extensive, and large quantities of both gold and silver are used in various kinds of manufactures.

(CONTINUED ON PAGE 186.)

* Hunt's *Merchants' Magazine*, for August, 1863 contains the following table showing the relative value of gold to silver at various periods from 1344 to 1863, as shown by the prices paid bythe mint in London:

	Gold to silver.		Gold to silver.
1344	1 to 12.475	1547	1 to 11.400
1349	1 to 11.141	1549	1 to 11.250
1356	1 to 11.286	1552	1 to 11.186
1401	1 to 11.305	1553	1 to 11.198
1421	1 to 10.525	1560	1 to 11.315
1464	1 to 10.331	1600	1 to 11.100
1465	1 to 11.983	1604	1 to 12.109
1470	1 to 11.446	1626	1 to 13.431
1482	1 to 11.429	1666	1 to 14.485
1509	1 to 11.400	1717	1 to 15.209
1527	1 to 11.445	1816	1 to 15.632
1543	1 to 12.000	1849	1 to 15.632
1545	1 to 10.714	1852	1 to 15.371
1546	1 to 10.000	1863	1 to 15.039

† Page 142; see, also, Chevalier's Political Economy, sec. III, chaps. I and II.

MARKET REVIEW.

FRIDAY EVENING, March 20, 1868.

Gold and Silver Stocks.—The market has quieted down, with but few transactions. Montana G. & S. has advanced to 80c., with sales at that figure. Quartz Hill has also advanced, and now sells at $1 15; Consolidated Gregory has declined to $3 15; Owyhee Mining is still held at $15 00; Combination Silver has declined to $55. To-day at the board quotations ranged as follows:

	Bid.	Asked.		Bid.	Asked.
Alameda Silver	80	1 00	Keystone Silver	— 2	— 3
American Flag	— 65	70	La Crosse Gold	— 51	54
Atlantic and Pacific	— 50	—	Liberty Gold	— —	4
Bates & Baxter Gold	— —	75	Manhattan Silver	— —	160 00
Benton Gold	— 20	— 40	Midas Silver	— 31	50
Black Hawk G	4 00	5 00	Montana Gold	— 78	80
Bobtail Gold	1 00	1 50	New York	— 55	60
Bullion Consolidated	— —	1 00	New York & Eld'o	— —	1 75
Columbian G. & S.	— 3	— 6	Nye Gold	— 2	3
Combination Silver	— —	55 00	Owyhee Mining	— —	15 00
Consolidated Gregory	3 10	3 20	Ophir Gold	— —	— —
Corydon Gold	— 30	— 35	People's G. & S. of Cal	— —	25
Edgehill Mining	3 75	3 90	Quartz Hill	1 10	1 15
Gold Hill	— —	4 00	Reynolds Gold	— —	— 4
Gunnell Gold	— —	1 10	Rocky Mountain Gold	— 17	— 20
Gunnell Union	— —	45	Smith & Parmelee Gold	2 65	2 75
H'n G & S. bs	— —	91	Sensenderfer	— —	6 50
Harmon G. & S. bs	— —	2 50	Symonds Fork Gold	— —	1 00
Holman	— 5	10	Texas Gold	— 5	— 12
Hope Gold	— 10	25	Twin Riv Sil	— —	75 00
Kipp & Buell Gold	— 6	20	Vanderburg G	— —	15

Copper Stocks.—Davidson has declined to and is quite firm at 40c.; Gardiner Hill to $1, and Knowlton to $1 50. Rockland is held at $4 50. The market to-day was thus quoted:

Caledonia C	— —	10 00	Hilton	— —	1 00
Canada	— —	— 50	Knowlton	— —	1 50
Davidson	40	44	Minnesota	3 00	4 50
Gardiner Hill	— —	1 00	Rockland	....	4 50

Petroleum Stocks.—Bennehoff Run is firm at $1 70, and Buchanan Farm at 40c. United States has declined to $1 80. At the board this afternoon prices were thus quoted:

	Bid.	Ask'd.		Bid.	Ask'd.
Bennehoff Run	1 70	1 90	N. Y. and Alleghany	....	3 00
Brevoort	....	40	Pit Hole Creek	70	90
Buchanan Farm	40	42	Rathbone Oil Tract Co	....	....
Central	50	55	Rynd Farm	6	10
Clinton Oil	75	1 10	United Pet. Farms	....	12
Manhattan	....	10	United States	1 80	1 90
National	....	3 00	Union	1 25	....

Miscellaneous Stocks.—Walkill Lead, 27; Del. & Hudson Canal, 151; Quicksilver, 20⅞; Cumberland, 32¼; New York Central, 122¼; Erie, 71⅜; Reading, 92¼; Michigan Southern, 88¾; Northwestern Pref., 73¼; Rock Island, 93¾; Fort Wayne, 102¼; Pacific Mail, 109⅝; Adams' Express, 74½@75; American, 68½@70; United States, 71@71⅛; Wells, Fargo & Co., 35@35⅛; Merchants' Union, 35 per cent., 34¾@35.

Government Stocks are dull, but prices are steady. There is but little investment demand. Quotations range:

U. S. 6s, 1881, coupon	110¾@110¾
U. S. 5-20s, 1862, coupon	110 @110¼
U. S. 5-20s, 1864, coupon	107¾@107⅞
U. S. 5-20s, 1865, coupon	108 @108¼
U. S. 5-20s, 1865, coupon	106¾@107
U. S. 5-20s, July, 1865, coupon	107 @107⅛
U. S. 5-20s, July, 1867, coupon	100⅞@101
U. S. 10-40s, coupon	105¾@106
U. S. 7-30s, June, large	105¾@106
U. S. 7-30s, July, large	

Foreign Exchange is dull. There is but little demand from importers, who appear disposed to defer remittances in hope of a lower premium on gold. The supply of bills, however, is moderate, and rates remain steady. We quote:

London, (prime bankers') 60 days'	109⅛@109¾
London, (prime bankers') sight	110 @110⅛
London, prime commercial	— —
Paris, (bankers') long	5.16¼@ 5.15⅝
Paris, (bankers') short	5.13¾@ 5.13⅛
Antwerp	5.17½@5.15
Swiss	5.17½@5.15
Hamburg (bankers')	36⅛@36¼
Amsterdam (bankers')	41⅛@41⅜
Frankfort (bankers')	41 @41⅛
Bremen (bankers')	79⅛@79¼
Berlin (bankers')	71¾@72

Gold is moderately strong at 138⅛@138⅜. American silver is in moderate request at 5¾@6¼c. below the price of gold. Mexican dollars are quoted at 102¾@103¾ in gold.

Gold loans are made without interest, and from 7@10 per cent. per annum was paid for carrying.

Money continues very active. Brokers have made early application for loans, and have been able to make up their balances without much difficulty, although at full rates of interest. Some of the private bankers still obtain 7 per cent. in go.d, or 7 per cent. currency and a commission, and in some cases money is engaged at these rates for some days to come. One of the banks is said to have loaned at 7 per cent. in gold.

Discounts are very dull, the entreme activity in call loans absorbing, to an unusual extent, the available funds. Prime paper is quoted 7@8½ per cent.

The steamship Hermann, from this port on Thursday, for Europe, took out $30,000 in specie.

We are indebted to Messrs. Platt & Newton for the following financial advices from San Francisco, under date of February 29th:—Gold bars are scarce and in demand, selling at the advanced rates of 910, and with every prospect of reaching 920 before the sailing of the steamer on the 29th inst. The silver bullion market is in an excited condition, owing to unusual competition among capitalists for its possession. Silver bars are very scarce, and ranging all the way from ¼ to 1¼, and even as high as 1½ per cent. premium, with a strong upward tendency. We quote currency bills on Atlantic cities at 38@39 per cent. premium on gold; sight drafts, payable in coin, at 1 per cent. premium; telegraphic transfers 1¼ per cent.; sterling exchange, 48¾d., and commercial exchange, 49¼@49¾d. Treasure freights have advanced to ½, while a few small remittances were forwarded at ¾ per cent.

The shipments of treasure from February 1 to date, have been as follows:

February 8—Per Idaho to Honolulu			$25,000 00
" 10—Per Montana—			
To New York	$1,038,781 30		
To Panama	20,000 00	—1,058,781 30	
February 18—Per Golden City—			
To New York	$476,147 47		
England	2,616 74		
France	2,652 07		
Panama	20,000 00	— 501,416 28	
February 19—Per John Wooster to Hong Kong		59,707 81	
Total since Feb. 1, 1868			$1,644,905 39
Previously this year			3,825,963 27
Total since Jan. 1, 1868			$5,470,868 66
Corresponding period 1867			7,267,340 24
Decrease this year			1,796,471 58

Copper has been quiet, but is on the whole, firmly held. The sales do not exceed 300,000 to 400,000 lbs, at 23½@23¾c. for Detroit; 23¾ for Baltimore, and 23¾@23¾ for Portage Lake.

Tin.—Sales of 300 slabs Straits at 23¼; 500 slabs at 23¾, 30 days. Banca is nominal, 27; English, 23¾.

Spelter—100 tons Silesian was sold at 6¼; gold to arrive.

Lead is steady at 6¾ to 6½; gold for ordinary foreign with a moderate business.

Petroleum.—The market is dull and heavy. We quote: Crude (40@47 gravity) in bulk, per gallon, 13c.; refindd, in bond, (110 test), prime light straw to white, 25½c; refined, in bond, (110 test), standard white, 26c.; residuum per bbl. $3 50.

Receipts for the week ending March 17	pkgs	16,263
Exports for the week	galls	1,132,277
Do. from Jan. 1st		8,707,371
Do. same time last year		4,976,789

THE SLATE TRADE.

From our Buffalo Correspondent.

The western slate market does not present as encouraging an aspect as was noticed in the spring of '67. This assertion may seem strange when it is generally known that for years the popularity of this roofing material has steadily advanced, and the fact admitted of its superiority; but the varying and high prices of slate, compel those who wish to use it, to use other material, because there exists no real necessity for these facts. The whole difficulty being in the injudicious action of the slate makers.

I have recently returned from an extensive trip among the buyers of slate in the west—in Cleveland, Cincinnati, Chicago, Columbus, Dayton, Indianapolis, St. Louis, etc., where the principal buyers are found, as well as the smaller dealers in cities of less size. These dealers are seldom in a position to give a staple price for slate roofing, which is not the case with the dealers in cheaper material. The quarrymen feeling that they can, through the want of judgment and unanimity of their employers, ask exorbitant wages, use this power to the detriment of the trade, and as soon as any demand exists for slate, strike for higher wages.

The close of last year found a large stock of unsaleable slate on hand, costing more than can be realized, and now at the commencement of spring, a strike exists which, if acceded to, will place the cost of slate to the highest price of last season, as the manufacturers have no choice but to advance the prices, as they are compelled to advance wages. This is prejudicial to their business, as at this time, builders and contractors are preparing and deciding upon material for building, etc., and the high price will force them to use, to a large extent, cheaper or poorer material. If these quarrymen were not receiving fair compensation, the matter would be different, but last year those in the vicinity of Fairhaven, Vt., purchased from the Bank some $17,000 worth of U. S. Bonds. In Pennsylvania, the manufacturers endeavored to induce the men to accept fair wages and work all winter, with no effect, and the quarries generally were idle. In Vermont, the leading quarries belonging to the Eagle Slate Company, at Hydeville, gave employment to their men, paying them $2 per day, promising an advance of 25c. per day on the 1st of March, but the men demanded $2 50 per day, intimating that they would demand $3. This company refused to advance the value of their stock and the men stopped, and with their bonds, etc., may hold out until their demands are acceded to, unless the determination to resist their unreasonable demands is unanimous. There are not enough men in this county—those that are here, being mostly Welshmen, do all in their power, in their correspondence home, to discourage emigration, asserting that constant employment cannot be obtained—citing that the largest of the Pennsylvania quarries, belonging to the Chapman Co., in Northampton county, who employ some two hundred men, were idle—when the fact is, this company desired the men to work, and offered them $2 50 per day, and employment all winter, which they will not accept.

I notice that the manufacturers are realizing the danger that is menacing their trade, and are perfecting an organization to import more men, having an agent in Europe at this time to obtain men—advancing the money requisite to defray their expenses and giving permanent employment to them here.

The importance of this movement should not be overlooked by any of the manufacturers in this country, as being the main thing necessary to make their manufacture a staple article, and the business a paying one. It is, therefore, urged that all such as are not at this time interested in this movement, will send their subscription of the number of men they will take, to the office of the JOURNAL OF MINING.

Having no interest in this except a desire to see this really important branch of business where it should be, and which only the shortsightedness of the manufacturers themselves prevent it from assuming, I would urge the consideration of these suggestions to the trade. For three years it has struggled to obtain its proper footing among the staples of the American market—its popularity increasing—its value and superiority unquestioned. It is only needed that a standard price be made in the spring, to continue during the year—a price as low as the legitimate cost of the production will afford, because there are still in this country various kinds of nearly worthless material which competes with slate, and which will take years to develope their worthlessness; and the only method to do this, is to have enough men to do the work—have a liberal but fair and unalterable compensation agreed upon, and the manufacturers and men will be the gainers—the former by having an article always marketable—the latter steady employment the whole year, and the buyers and users will feel a confidence and satisfaction in the trade, all of which will tend to redeem it from its present vacillating and unsteady position, and make it more general and popular.

THE IRON TRADE.

NEW YORK, March 20, 1868.

Pig Iron.—Scotch is dull under the decline in gold. The extreme quotations of the beginning of the week—$43 for Glengarnock from yard, are not sustained; American is dull at $39, for No. 1, but with little offering:

Old Rails are very quiet. We note the sale of 100 tons at private terms.

Bar Iron is unchanged.,

BOSTON, March 18, 1868.

Pig Iron is firm and in demand, and prices have advanced with sales of Scotch, Gartsherrie and other brands, No. 1, at 43@45 ; and American at 44@45. In Bar Iron there has been a fair business ; In Russia Sheet Iron, no transactions, and prices are nominally 11@11¼c. per lb., gold.

Weekly Statement of New York Imports.

The following table shows the quantity and value of iron and steel imports at the New York Custom House, for the week ending and including March 13, 1868 :

	QUANTITY.	VALUE.
Chains and Anchors	134	$4,693
Iron, hoop, tons	80	3,389
Iron, pig, tons	36	1,382
Iron, Railroad bars	5,626	44,052
Iron, sheet, tons	1	47
Iron, tubes	5	116
Iron, other, tons	1,367	29,596
Steel	2,217	32,761
Total value		$116,036

Boston Imports of Pig Iron from January 1 to March 14, 1868.

	1868.	1867.
From Great Britain, tons	1,573	8,475
Coastwise Ports	3,234	1,069

Lehigh Valley Iron Trade.

The following table shows the amount of Pig Iron transported over the Lehigh Valley Railroad for the week ending March 14, 1868, and for the season to that date.

From	Tons.	Total
Carbon Iron Co	435	2 445
Lehigh Valley Iron Co	310	2,260
Thomas Iron Co	1,010	5,900
Lehigh Crane Iron Co	420	2,990
Allentown Iron Co	465	1,090
Robert Iron Co	255	2,275
Glendon Iron Co	850	4,070
Other shippers	640	1,732
Total	..	22,672

Exports of Iron and Steel from Great Britain to the United States.

The Report of the Board of Trade, just issued, shows that during the year ending December 31, 1867, the following quantities of iron and steel of all kinds, were exported from the various British ports to this country :

	1866. Tons of 2,000 lbs.	1867. Tons of 2,000 lbs.
Iron, pig and puddled	108,304	133,792
" bar, angle, bolt and rod	79,725	50,778
" railroad, of all kinds	117,878	185,041
" castings	1,752	1,333
" hoop, sheet and boiler plate	34,352	33,256
" other wrought, of all sorts	12,431	7,816
Total of iron	345,442	412,216
Steel unwrought	23,584	21,308

Market Prices.

NEW YORK, March 20, 1868.

DUTY.—Bars, 1 to 1¼c. per lb. ; railroad, 60c. per 100 lbs. ; boiler and plate, 1¼c. per lb. ; sheet, band, hoop and scroll, 1¾ to 1¾c. per lb. ; pig, $9 per ton ; polished sheet, 3c. per lb. Payable in gold.

Anthracite, No. 1, best.	$40 00@—	—	
" " 2x, fdry,	38 00	—	—
" Grey Forge,	32 00	35	00
Scotch Pig, from yard	42 00	43	00
Charcoal, coal blast	50 00	60	00
Old Wrought sc'p, fm yd.	47 50	—	—
" " " fm. vsl.	43 00	—	—
English rails, gold	52 00	53	00
American " at works.	78 00	80	00
Old Railroad Iron	46 00@		

RETAIL PRICES.

Hoops, ⅝ per ton	$190	00	
" ¾ "	160	00	
" ⅞ "	150	00	
" 1 "	140	00	
" 1¼ "	137	50	
" 1¼ to 2 per ton	137	50	
Scroll Iron—⅝x14 per ton	180	00	
" 12 "	170	00	
" 10 "	160	00	
" 3-16 "	150	00	
" ¼ "	140	00	
" ¾x14 "	160	00	
" 12 "	150	00	
" 10 "	140	00	
" 3-16 "	135	00	
" ¼ "	132	50	
Swed'h I'n, ord'y sizes	150	00	

Swedish Iron.

1¼x¾ to ⅝ and ¾ to 2 in sq	155	00	
1¼x¾ to ¾x⅞ "	160	00	
6 to 12x¾ to 5-8	165	50	

Common Iron

¾ to 2 in. round and sq	....	....	

Refined Iron.

¾ to 2 in. r'd and sq	95	00	
1 to 6 in. wide x ¾ to 1 th.	90	00	
3¼ and 3½ round and sq	105	00	

Rods—5-8 and 11-16, round & sq., per ton 100 00

½ and 9-16 round & square. 105 50

7-16, round and square 115 00

⅜ " " " 120 00

5-16, " " " 125 00

¼ " " " 130 00

3-16, " " " 160 00

Horse Shoe Iron 125 00

Band—1 to 6 in. x 3-16 to No. 12 130 00

Ovals and half Rounds.

¾ to 1¼ 120 00

½ & 11-16 125 00

⅜ & 9-16 130 00

Nail Rods, per lb. 9@10

Norway Shapes 8¾c

Spring Steel —@ 9¾

Tire " ⅞ to ¼x¼ & 5-16 10½c

Toe Cork Steel 10½c

Sleigh Shoe Steel 10½c

Plow Steel—6 to 14x¼ to ⅜ 10c

BOSTON, March 18, 1868

Swedish—common ass'd	$150@155		
English—com	85	90	
do refined	95	100	
do sheet, per lb	6½@10c.		
Russia, sheet	15@16c		

Scotch Pig, No. 1 .....

Gartsherrie $43@45

No. 1, other brands 43 45

American, No. 1 44 45

LONDON, February 29, 1868.

Bars, Welsh in Lond.	£6	5	0@..	....		
Ditto to arrive	6	5	0	..	....	
Nail rods	6	15	0	7	....	
" Stafford in Lond.	7	7	6	8	10	0
Bars	7	7	6	8	10	0
Hoop	8	7	6	9	12	6
Sheets, single	9	2	6	10	0	0
Pig, No. 1, in Wales	3	15	0	4	5	0
Refined metal, ditto	4	0	0	5	0	0
Bars, common, ditto	5	7	6	5	10	0
Do. merch. Tyne or Tees	6	10	0	....		

Do. railway, Wales	£5	5	0@£5	10	0	
Do. Swd. in London	10	0	0	10	5	0
To arrive	10	0	0	10	5	0
Pig, No. 1, in Clyde	2	12	6	2	17	9
Do. f.o.b, Tyne, Tees	2	9	6	..	....	
Do. Nos 3, 4, f.o.b. do	2	6	6	2	7	0
Railway chairs	5	10	0	5	15	0
" spikes	11	0	0	12	0	0
Indian Charcoal Pigs in London, pr. ton,	7	0	0	7	10	0

STEEL.

Swed., kegs (rolled)	14	5	0	..	..	..
" (hammered)	15	5	0	15	10	0
Swed., in faggots	16	..	..	..	..	0
English, spring	17	0	0	23	..	0

THE COAL TRADE.

NEW YORK, March 20, 1868.

Trade is in an unsettled condition. Prices and freights are nominal. Next week will probably develope some concert of action of the various transportation companies ; as yet we are all in the mist. Coal is very scarce for delivery for ten or fifteen days yet, and the trade generally has been dull during the past week in consequence. Freights are everything and anything, and are quoted some 75 cents lower to river and Eastern ports when any are taken ; from Elizabethport 65 to 70 cents, and from Port Johnston 60 to 65 cents to this city.

The Delaware & Raritan Canal will open for business on Monday next, the 23rd inst.

The Hazleton Railroad Company, a lateral of the Lehigh Valley Company, have advanced their freights 5c. per ton from this date. No reasonable cause is assigned. Our rivers and bay are clear of ice, and next week we hope to publish in full the freights from Newburgh, Rondout, Elizabeth, Port Richmond, Port Johnston, and a budget of interesting items.

The 60th Scranton sale is advertised in our columns to take place on Wednesday next, the 25th inst. 75,000 tons are to be disposed of at the usual time and place.

BOSTON, March 18, 1868.

The Boston Market is quiet. English Cannel is scarce, and nominally $22 for large, and $24 per ton for small lots. In Sydney and Pictou nothing has been done, and prices are quite nominal. Cumberland has been selling at $8 ; and Penn and Westmoreland Gas, delivered in Philadelphia, at $7 20 per ton. Anthracite is unsettled and selling in retail lots at $10@$12 per ton.

The following table exhibits the quantity of Coal passed over the following routes of transportation for the week ending March 14, 1868 :

	1867. WEEK.	1867. YEAR.	1868. WEEK.	1868. YEAR.	INC. OR DEC. WEEK.	INC. OR DEC. YEAR.
Phil. & Reading R. R.	57,607	499,117	57,046	550,702	d 561	i 51,585
Lehigh Valley R. R.	25,003	302,622	48,997	503,778	i 23,994	i 201,155
Scranton North	8,223	69,643	6,961	76,596	d 1,262	i 6,953
" South	26,249	236,215	23,953	199,451	d 2,296	d 36,764
Penn'a Coal Co. Rail.	15,891	87,689	15,088	102,316	d 803	i 14,627
Shamokin	12,910	67,234	8,314	66,140	d 4,596	d 1,114
Trevorton	.....	3,866	340	4,174	.....	i 308
Short Mountain	500	4,082	1,209	7,088	i 709	i 3,006
Lykens Valley C. Co.	.....	5,001	.....	14,604	.....	i 9,603
Broad Top	.....	35,122	4,358	31,789	.....	d 3,333
W'mstown Col'y, E.	1,207	11,744	2,211	22,888	i 1,003	i 11,144
Total	147,590	1,322,356	168,477	1,579,526	.....	.....
	.....	1,579,525	147,590	.....	.....	.....
Increase	.....	257,171	d 20,887	.....	.....	.....

Lehigh Coal Trade.

SHIPPED BY RAILROAD FOR THE WEEK ENDING MARCH 14, 1868.

WHERE SHIPPED FROM.	WEEK. Tons. Cwt.	PREVIOUSLY Tons. Cwt.	TOTAL. Tons. Cwt.
WYOMING REGION.			
Franklin Coal Co	.....	.....	.....
Audenreid	.....	50 06	50 06
Lehigh & Susquehanna	.....	.....	.....
Germania Co	267 02	3,279 15	3,546 17
Wilkesbarre Coal & Iron Co	1,901 14	9,822 04	11,723 18
Warrior Run	498 10	4,455 07	4,953 17
Parrish & Thomas	1,419 13	16,239 10	17,659 03
New Jersey	298 10	4,479 14	4,748 09
Union	302 05	2,014 04	2,316 09
Wyoming Coal & Transportation Co	.....	3,227 02	3,227 02
Newport C. C	.....	.....	.....
Morris and Essex Mutual C. C	72 09	749 02	821 11
Consumers	192 12	.....	192 12
Everhart C. Co	.....	.....	.....
Plymouth C. C	.....	152 14	152 14
H. B. Hillman & Son	269 15	2,302 00	2,571 15
Bowkley, Price & Co	.....	149 08	149 08
Mineral Spring	398 10	3,422 05	3,820 15
Valley Coal Co	.....	.....	.....
Enterprise Colliery—J. H. Swoyer	710 07	6,039 04	6,749 11
G. B. Linderman & Co	.....	.....	.....
Washington C C	.....	.....	.....
West Pittston	.....	.....	.....
Barclay Coal Co	.....	.....	.....
Shawnee	202 02	2,046 13	2,248 15
Consumers Coal Co	.....	1,134 07	1,134 07
Harvey & Bro	50 08	984 03	1,034 11
Wyoming Valley	202 16	553 00	755 16
Other shippers	4 10	.....	4 10
Total Wyoming	6,761 08	61,100 18	67,862 06
B. M. REGION.			
New York & Lehigh	.....	8,918 17	8,918 17
Honey Brook	4,093 18	26,494 14	30,588 12
German Penna. Coal Co	1,492 05	8 667 11	10,159 16
Spring Mountain	2,262 05	20,054 08	22,316 13
Coleraine	1,373 02	13,249 05	14,622 07
B. Meadow, D. W	.....	.....	.....
John Connery	.....	.....	.....
Lehigh Zinc Co	.....	.....	.....
Spring Brook	.....	.....	.....
Other Shippers	5 14	79 13	85 07
Total B. M. Reg	9,227 04	77,464 08	86,691 12
HAZLETON REGION.			
Central Coal Co	.....	.....	.....
Ashburton Co	52 15	247 09	300 04
Mount Pleasant	511 04	4,265 00	4,776 04
Hazleton	5,490 19	49,076 17	54,567 16
East Sugar Loaf	2,222 12	32,040 00	34,262 12
Mount Hall	.....	219 14	219 14
Latimer (A. Pardee, Jr., Bro. & Co)	926 07	7,104 16	8,031 03
Stout Coal Co	822 01	5,176 07	5,998 08
Harleigh	961 08	13,577 15	14,539 03
Ebervale C. Co	1,584 16	16,971 09	18,556 05
Jeddo (G. B M. & Co)	2,691 13	31,703 07	34,395 00
Woodside, J. C. Co	435 09	2,841 03	3,276 12
Highland Coal Co	1,082 02	16,649 07	17,731 09
Cross Creek	695 07	4,973 18	5,669 05
Council Ridge	1,668 01	22,372 05	24,040 06
Buck Mountain	2,126 01	14,413 02	16,539 03
Other shippers	.....	.....	.....
Total Hazleton	21,270 15	221,632 09	242,903 04
UPPER LEHIGH REGION.			
Upper Lehigh Coal Co	1,463 03	16,861 11	18,324 14
Total U. L. Reg	1,463 03	16,861 11	18,324 14
MAHANOY REGION.			
Trenton Co	.....	.....	.....
Mount Etna	.....	591 00	591 00
Mahanoy Colliery	480 03	7,104 17	7,585 00
Delano	.....	.....	.....
Glendon Colliery	1,337 07	7,173 06	8,510 13
Primrose Colliery	.....	550 05	550 05
E. S. Silliman	2,258 19	27,660 05	29,919 04
McNeal Co	1,859 16	5,389 09	7,249 05
Knickerbocker	1,831 16	11 372 11	13,204 07
Thomas Coal Co	659 05	44,1 4 19	4,774 04
Williams & Herring	137 11	2,053 05	2,210 16
New Boston C. C	968 16	7,422 07	8,391 03
Shamokin C. C	.....	.....	.....
Caledonia M. and M	621 01	4,373 12	4,994 13
Coal from Catawissa Railroad	.....	.....	.....
Other shippers	.....	15 13	15 13
Total Mahanoy	10,274 14	77,721 09	87,996 03
Grand total	48,997 04	454,780 15	503,777 19
Same time last year	25,003 07	277,619 01	302,622 08
Increase	23,993 17	177,161 14	201,155 11
Decrease	.....	.....	.....

Schuylkill Coal Trade.

BY RAILROAD, FOR WEEK ENDING MARCH 19, 1868.

St. Clair	32,083
Port Carbon	4,003
Pottsville	.....
Schuylkill Haven	14,690
Auburn	1,149
Port Clinton	3,778
Total for week	56,104
Previously this year	550,702
Total	606,806
Same time last year	553,933
Increase	52,873

Cumberland Coal Trade.

From the Alleganian.

By B. & O. RAILROAD.—The shipments over the Baltimore and Ohio Railroad, for the week ending March 14, were as follows:

From Cumberland & Pa. R. R., via Cumberland :		
Consolidation Company		428 05
American		1,249 18
Borden	do.	79 15
New Hope	do.	77 06
Midland	do.	....
Via Piedmont.		
George's Creek C. & I. Company		338 15
Central	"	1,699 13
Atlantic	"	189 04
Piedmont	"	253 17
Swanton	"	955 00
Potomac	"	1,240 16
Franklin	"	101 15
Total		6,604 04
From Eckhart Railroad.		
C. C. & I Co		1,340 05
Total		7,944 09

Prices of Coal by the Cargo.

[CORRECTED WEEKLY.]

At New York, March 20, 1868

Schuylkill R. A., choice	$....@$....		
" Ordinary	....	....	
" W. A., Lump	....	....	
" Steamboat	....	....	
" Broken	....	....	
" Egg	....	....	
" Stove	....	....	
" Chestnut	....	....	
Lehigh White Ash Lump.	5 75	...	
Lehigh Broken	5 25	....	
" Egg	5 25	....	
" Stove	6 00	....	
" Chestnut	4 75	....	
Wilkesbarre Lump	5 00	....	
" B'ken & Egg.	5 50	....	
" Stove	6 00	....	
" Chestnut	4 75	....	

SPECIAL COALS.—DEALERS' QUOTATIONS.

Diam'd Vein R. A., Sch'kill	....	....	
Locust Dale W. A., "	....	....	
Honey Brook " Lehigh.	5 50	....	
Harleigh " "	5 50	....	
Spring M'n " "	5 50	....	
Sugar Creek " "	5 50	....	
Ashburton " "	5 50	....	
Fulton White Ash	....	....	
Stout	....	....	
Broad Mountain	....	....	
Buck Ridge W. A., Sh'kin.	....	....	
H. Heils, E. S'kiln, Lorb.	5 50	....	
New England Red Ash	5 25	....	
Wyoming	5 00	....	
Locust Mount'n (Repplier)	5 50	....	
Duncan Red Ash "	6 00	....	
W'barre Coal & Iron Co	....	....	
New Burgh Orrell Gas Coal	....	....	
Old Co.'s " "	5 50	....	
Mt Pleasant	5 00	....	
Despard Gas Coal	....	....	

Dealers in these Coals may be found in our advertising columns.

At Philadelphia, March 20, 1868.

Lehigh Lump and St'mb't.	4 50@....		
" Broken and Egg	....	....	
" Stove	....	....	
" Chestnut	4 00		
Schuylkill R. A. Prepared	4 25	4 50	
" Chestnut	2 45	2 50	
" W. A. Lump and	3 00	3 25	
Steamboat	4 00	....	
" Broken	3 35	3 50	
" Egg and Stove	3 90	4 00	
Schuylkill Chestnut	2 45@2 50		
Locust Mount Lump and Steamboat	3 00	3 25	
" Broken	3 50	3 65	
" Prepared	3 90	4 15	
" Chestnut	2 60	2 75	
Lorberry Coal	4 25	....	
Shamokin	5 00	....	
Franklin, (Lykens Valley)	5 00	....	
Broad Top	4 60	....	

Scranton Coal at Elizabethport, March 20, 1868.

(Corrected weekly by D. L. & W. R. R. Co.)

Lump	$4 00@....		
Steamer	4 25	....	
Grate	4 75	....	
Egg	4 75	....	
Stove	5 50	....	
Chestnut	4 25	....	

Prices for Pittston Coal at New York, March 20, 1868.

(Corrected weekly by Penna. Coal Co.)

Lump, per ton of 2240 lbs.	$5 40@....		
Steamer, " " "	5 40	....	
Grate " " "	5 40	....	
Egg " " "	5 40	....	
Stove " " "	5 60	....	
Chestnut " " "	4 90	....	

Lackawanna at New York, March 20, 1868.

Lump	$4 10@....		
Steamer	4 10@....		
Grate	4 10@....		
Egg	$4 10@....		
Stove	4 30	....	
Chestnut	3 90	....	

Lehigh Coal at Elizabethport, March 30, 1868.

Lump	5 00@....		
Steamboat and Broken	5 00	....	
Egg	5 00	....	
Chestnut	4 50	....	
Stove	5 50	....	

Wilkesbarre Coal at Elizabethport, March 20, 1868.

(Corrected by Wilkesbarre Coal & Iron Co.)

Lump	$4 50	....	
Steamer	4 50	....	
Broken	4 75	....	
Egg	5 00	....	
Stove	5 25	....	
Chestnut	4 50	....	

Ten cents additional on shipments from Jersey City.

At Baltimore, March 20, 1868.

Wilkesbarre & Pittston W. A. by car	$5 50@5 75		
Lykens Valley R. A. by car	5 75@ 6 25		
Sunbury & Shamokin R. or W. A. by car	5 50	5 75	
From wharf or yard, 75c. to $1 per ton additional.			
Retail, del'd, per 2,240 lbs	7 00@7 75		
George's C'k and Cumberland f. o. b. at Locust P't for shipping	4 60@4 75		

At Havre de Grace, Md.

Wilkesbarre or Pittston, W. A., on board	$4 85@5 10		
Sunbury or Shamokin, R. or W. A., on board	....@5 25		
Lykens V'y, R. A. on b'd.	5 60@5 85		

The above rates are only nominal. Shipping at this port is suspended for the season.

At Georgetown, D. C.

George's Creek and Cumberland on board $....@ 4 10

Prices of Gas Coals at New York,

March 14, 1868.

PROVINCIAL.				AMERICAN.	
Block House (on board)	$2 00	gold		Westmoreland Coal Co	$3 50
Gowrie "	1 75	"		Despard " "	8 50
Lingan "	1 75	"		Cameron " "	8 50
Sydney "	2 25	"		Penn " "	8 50
Pictou "	2 25	"		Newburgh Orrel Gas "	8 50
Little Glace Bay "	1 87½	"			
International Co.'s "	1 75	"			
Slack Coal B. H., "	75	"			
" L. G. B.,	1 00	"			

Coal Freights.

(Corrected Weekly.)

From Elizabethport.

Albany	$1 00@—	—		New London	1 50	— —
Boston	2 75	3	00	Newport	1 50	— —
Bridgeport	1 25	—	—	New York	65	— —
Fall River	1 50	—	—	Norwalk	1 50	— —
Hartford	2 00	—	—	Norwich	1 75	— —
Hudson	1 05	—	—	Pawtucket and towing	3 50	— —
Lynn	—	—	—	Portland	2 75	— —
Middletown	1 75	—	—	Portsmouth	2 00	— —
New Bedford	1 75	2	25	Providence	1 75	— —
Newburyport	3 00	—	—	Salem	3 00	— —
New Haven	1 25	2	00	Taunton	2 00	— —

Foreign Freights.

New Castle and Ports on Tyne €16 keel.

Liverpool 12s. 6d.@15s. ton.

SAN FRANCISCO STOCK MARKET.

A Telegram from San Francisco, dated March 18th, to Messrs. LEES & WALLER, Bankers, 33 Pine street, this city, quotes Nevada silver and other stocks as follows :

STOCKS.	Bid per Ft.	STOCKS.	Bid per Ft.
Gould & Curry	630@ 650	Belcher	350@ 370
Savage	3,200@3,400	Imperial (per share)	260@ 270
Choliar Potosi	225@ 230	Alpha	1,350@ ..
Ophir	185@ ..	Kentuck	370@ 380
Hale & Norcross	..@ ..	Cal. Steam Navigation Co.	..@ ..
Crown Point	2,100@2,250	Cal. State Telegraph Co	..@ ..
Yellow Jacket	1,400@1,410	Greenbacks	..@ ..

Copper Ore.

SAN FRANCISCO, Feb. 18th, 1868.

The Mining Press gives the following as an approximate price at which copper ores can now be sold in San Francisco. There is no sale for ores which assay less than 12 per cent. The late reduction in price is on account of high freights :

	Per ton.		Per ton.
12 per cent ore	$16 00	22 per cent ore	$43 56
13 " "	18 62	23 " "	46 45
14 " "	20 20	24 " "	49 33
15 " "	21 25	25 " "	52 22
16 " "	26 23	6 " "	55 11
17 " "	23 12	27 " "	58 00
18 " "	29 91	28 " "	60 80
19 " "	34 90	29 " "	63 77
20 " "	37 78	30 " "	66 66
21 " "	40 67	31 " "	69 55

BOSTON STOCK MARKET.

(By Telegraph.)

BOSTON, March 20, 1868.

Bos., Hart & Erie RR	14½	Rockland	—
Calumet	29½	Cary Improvement	7⅞
Franklin	15⅞	Isle Royal	—
Hecla	—	Minnesota	3
Copper Falls	23½	Quincy	26
Hancock	5¼	Water Power	20½

Sales at Boston Stock Exchange, March 19

100 shs. Bay State	3	25 shs. Copper Fc	23½
100 do do.b.10	3½	60 do N. Cliff	50
100 do do.b.60	3½	300 do Petherick	95
50 do do	2⅜	75 do Pewabic	8¼
100 do Bos., H & Erie	14¼	SECOND CALL.	
100 do do.b.30	14⅜	100 do Allouez.b. 30	37½
50 do do.b 60	14½	100 do Bos. Hart & E	14½
50 do do	14⅜	50 do Pittsburg	23½

London Weekly Metal Report.

LONDON, E. C., Feb. 28, 1868.

There has been more inquiries for metals during the last few days, and though the amount of business has not actually increased, still we have reason to anticipate an improved demand before long.

IRON.—Welsh bars are without change. Rails have been sold at a light advance. The reports from Staffordshire are still unfavorable. Business in Scotch pig iron has been quiet ; the price of warrants is 52s. 4½.

COPPER.—Considerable sales of English tough has been made by the smelters to the trade for delivery in Birmingham at an advance of a couple of pounds from the lowest point. We quote tough here £74 to £75. Best, £76 to £77. Foreign is steady, but not higher. Burra, nominally, £ 3. 10s. Wallaroo, £78 10s. to £79. Chilli bars in Liverpool, £70

TIN.—An average amount of business has been done in Straits at £89 per ton. The market has a firmer tone, and there is not much tin for sale at present prices. Banca £91 to £91 10s. ; English unaltered. Banca in Holland : Spot, 52¼fl. ; ex sale 52¾fl.

TIN PLATES are steady , cokes rather dearer.

LEAD.—The market is very firm at £19 7s. 6d. to £19 10s. for good soft English pig ; £19 15s. for L B ; Spanish £19

SPELTER remains steads. Business reported the last few days at £20 5s. spot here for ordinary brands, and £20 12s. 6d. for specials. Common brands in imports, £20 7s. 6d. ; specials, £20 15s. buyers V3, £20 ; Belgian, £19 15s. to £19 17s. 6d.

VON DADELSZEN AND NORTH.

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Journal of Mining.

WESTERN & COMPANY, PROPRIETORS.

R. W. RAYMOND, EDITOR.

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NEW YORK, SATURDAY, MARCH 21.

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NOTICE TO SUBSCRIBERS.

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INTERNATIONAL COINAGE.

Coins are the most convenient standards of measure and weight. We do not mean that they can be employed in accurate determinations; the wear of circulation renders them too variable for that; but for many purposes they are sufficiently exact; and one purpose they might admirably serve, viz.: to familiarize the common people with a new unit of weight or measure sought to be introduced, and to secure its gradual adoption in daily life.

The French metrical system has recommended itself to the world solely by its completeness and consistency. The meter itself is not a very convenient unit; and it does not bear that exact relation to the dimensions of the earth which it was once supposed to bear. But these are points of little importance, compared with the great convenience of the system, of which the meter is the basis. Its decimal arrangement facilitates calculations, and its incomparable unity simplifies the relations of weight and measure to a remarkable degree. It has been justly observed, that a decimal system is not the natural one for minor calculations; that the carpenter, for instance, prefers to reckon in eighths, rather than tenths, of an inch; that halves and quarters can be at once determined by doubling a piece of string, while decimal fractions are altogether artificial in their nature.

This is true; but the fault is in our decimal notation, which, at this late day, probably no one will undertake to reform. The philosophers tell us that men derived the decimal notation from counting with their fingers. If that is the case, it is a great pity that they included their thumbs. Nature herself evidently put the thumb as a unit of the next higher order; and the mistake of including it among the digits, entails upon us an eternal difference between the instinctive calculations of every day, and the operations of the pencil. An octonal, instead of a decimal, notation, would almost abolish fractions. Think of that, ye miserable school-boys!

But having this decimal notation as a legacy from stupid Romans and Arabians, we must make the best of it, and accommodate to it, as far as possible, our weights, measures and money. Hence it is, that all men unite in wishing that the French metrical system may be made familiar to all nations. By persistent agitation, scientific men have succeeded, both here and in England, in making the meter legal. According to a recent law, the metrical weights and measures are recognized in this country. The next step is to make them familiar to the people.

This brings us back to the proposition with which we started: that the most convenient means to this end is the adjustment of coinage to the new standards. We have already taken steps towards this result. The five cent nickel coin of the United States weighs five grams (77.16 grains), and measures two centimeters in diameter. But the very serious omission to express this fact upon the face of the coin has rendered it practically inoperative. That omission should be remedied but, since the nickel coinage may vary in value, and disappear from circulation (as it did during the war), the true place for establishing and expressing metrical relations is on the standard gold coinage. This highly desirable measure is actually within our reach. The three-dollar gold piece weighs almost exactly five grams; and could be, without any difficulty or disturbance, of values assimilated to the metrical system. Evidently, then, the three-dollar piece is the best international coin. Five grams of standard gold (nine-tenths fine gold) might be declared current through the world, without disarranging the coinage of any nation.

Suppose that, in addition to this step, a law were passed, fixing the unit of weight for single postage at fifteen grams, (instead of fourtee and a fraction, as at present), how long would it be before the metrical weights, constantly represented by coins, would be household words on the lips of our people?

This gradual introduction of a decimal and admirably coordinated system would be sacrificed by the plan proposed by the late Paris Conference, which requires of us that our three-dollar piece, now almost exactly five grams, shall be altered to weigh 4.8387 grams.

Another serious point against the proposed plan, is, that it is based upon the supposition that the French gold coinage is as fine as ours, containing nine parts of gold to one of alloy. But the late report of the Director of the U. S. Mint points out the fact that for many years the French coinage which pretends to be "900 fine," has been really more debased. Assays of French gold coins from the mints of Paris and Strasbourg, dated from 1863 to 1867, show a fineness varying from 898.5 to 899.8, and averaging but 899.2. Mr. LINDERMAN observes that "this is important in its bearing upon the question of international coinage, for if such an interchange is to take place, the respective countries must keep good faith in regard to the fineness of their coins; otherwise, the matter will soon come to an end."

How much is it wise to sacrifice, for the sake of a monetary unity which has no other security than the permanence of the present rickety French system and the good faith of the French Government?

Great Britain instructed her delegates to be listeners at the Conference, and to do nothing calculated to bind their government. The queen has just appointed a commission of experts, to consider the bearings of the subject, and report their conclusions. This commission includes Viscount HALIFAX (in 1852, as Sir CHARLES WOOD, Chancellor of the Exchequer), Sir JOHN LUBBOCK, THOMAS BARING, THOMAS N. HUNT, Governor of the Bank of England, AIRY, the Astronomer Royal, THOMAS GRAHAM, Master and Worker of the Mint, CHARLES R. WILSON of the British Treasury, and a number of other gentlemen, distinguished in commerce, science and finance. We should do well to imitate in this matter the prudence and conservatism of England.

THE CONCENTRATION OF ORES—IV.

KUSTEL's book gives deserved prominence to jiggers, and, among these, to the continuously acting (or, as he terms them, the continual) jiggers. These machines bear a relation to the buddle, the percussion-table, the slime-separator and the labyrinth, similar to that which exists between concentration itself and subsequent reduction. The jigger, by separating the ore-grains from the sands and slime, saves expense in crushing, and diminishes the labor, while it increases the accuracy of the treatment of the finely divided ore.

But jiggers should seldom or never be used alone; and in many cases, their employment is entirely prohibited by the nature of the ore. Silver ores, for instance, are generally so disseminated in the gangue that fine crushing is necessary. The highly perfect cleavage of galena causes it to separate with ease from many kinds of gangue, and thus fits it for jigging. We examined at one time the concentrating works of the Manhan Lead Mines in Massachusetts, where Cullom's jigger was then in use; and, to our surprise, we could not detect, in a handful of coarse grains from the Cornish rollers, a single particle of galena still adhering to the quartz. The jigger could not have more favorable material than that. But silver ores generally adhere with tenacity to the gangue.

The principle of the jigger is the influence of specific gravity in a column of water, by which the mineral particles are separated while they fall, and arranged in layers, according to their density. But size and shape are elements that disturb the operation of gravity. A round globule of galena, one-eighth of an inch in diameter, and a round globule, of quartz four-eighths of an inch in diameter, will (according to RITTINGER) both reach the bottom of a column of water *at the same time*, though the volume of the quartz is sixty-four times, and its weight only twenty-two times that of the galena. This apparent paradox is worth an explanation, since it involves a law of the highest importance. It is well known that all bodies fall with equal velocity in a vacuum; and that differences in velocity are produced only by the resistance of the medium through which a body may fall. All other things being equal, therefore, the densest bodies fall most rapidly in a given medium, because the resistance bears a minimum ratio to the weight. Again, densities being equal, the largest bodies might be supposed, for the same reason, to be most retarded in their fall; but a moment's thought will show the fallacy of this conclusion. The resistance of the medium is proportional, not to the *size*, but to the *surface*, of the falling body; and the surface is a function of shape as well as size; and when shape is constant, does not increase directly as the volume, but as the square to the cube. One globule of quartz, then, having four times the diameter, and sixty-four times the volume, would have but sixteen times the surface, of the globule of galena. But its absolute weight is twenty-two times that of the galena; hence, with the increase of volume, the weight is augmented more rapidly than the surface; and the superior specific gravity of the galena is thus counterbalanced. A sphere is the maximum of volume with the minimum of surface; and a thin plate or scale may be considered as a maximum surface with minimum volume; hence, round grains fall more rapidly in water than oblong ones, and flat particles less rapidly than either. The relative velocities (density and volume being equal) are about 112 : 97 : 79.

The column of water in a jigger is too short to give full effect at once to these principles; but the jigging motion, or successive lifting thirty or forty times of the mass of ore through the water, obviates this difficulty; and gives to density, besides, more than its theoretical effect, by partly counteracting the unfavorable influence of irregularities in shape. Particles of galena, for example, of different shapes, fall with different velocities; but the jigger jigs them at last to the bottom together. Over sands and slimes, and pieces of gangue and ore adhering together (the average gravity of which is of course reduced in this way below that of the ore itself), the influence of the jigger is less potent; and here are the chief sources of loss by its use.

But silver ores are generally at once brittle, and finely diffused, so that they cannot be separated from the gangue without producing much fine sand and slime. The upper layers of material in the jigger could not therefore be considered as tailings; but would have to be treated again as slimes.

The jigger would not greatly reduce the amount of ore to be concentrated, and so, may be regarded as almost universally inapplicable to silver ores proper. Of course we do not refer to argentiferous galena.

KUSTEL cautions against inconsiderate attempts to concentrate silver ores by any wet process. The inevitable losses of the operation are heavy; and they may be rendered ruinous by injudicious or careless management.

GYPSUM IN NOVA SCOTIA.

A paper by Dr. How, of King's College, recently read before the Nova Scotia Institute of Natural History, treats of the properties and uses of Plaster, and its distribution in that Province.

Tables were read showing the number of tons of plaster shipped from the Province, and the countries to which it was exported, for a series of years. The totals were stated as follows: 1864, 52,625; 1865, 55,312; 1866, 54,478. The years of the American war, and those immediately following, were seasons of great depression in the gypsum trade; but lately it has resumed its activity. From January 1st, 1866, to December 31st, 55,751 tons were cleared from Windsor, valued at $50,256; but in the first nine months of 1867, 48,285 tons were exported, which manifests a great increase. The price of gypsum at Windsor is from 90 cts. to $1 per ton; the price on the Grand River, Western Canada, the only locality in Canada (Ontario and Quebec) where workable deposits occur, is about $2 a ton. The deposits there are quite insignificant, compared with those of Nova Scotia.

The county of Hants is the chief gypsum-raising county in Nova Scotia, and Windsor the principal port of shipment. Operations have been carried on at the Clifton quarry, at Windsor, about 40 years. The principal rock is gypsum; the anhydrite, or hard plaster, being found in lenticular masses from two to ten feet thick in the centre, and sometimes fifty feet long, imbedded in the soft plaster.

Pure gypsum, or soft plaster, contains, in 100 parts, about 33 of lime, 46 of sulphuric acid, and 21 of water. Anhydrite, or hard plaster, contains about 41 of lime, 59 of sulphuric acid, and, as its name implies, no water. It is equally valuable for agricultural purposes with gypsum; but far less abundant.

As the brines of former geological periods contained considerable lime, as well as soda; and as the sulphate of lime, from its comparative insolubility, would be naturally precipitated long before a deposit of the chloride of sodium, by evaporation, so we find rock-salt and gypsum occurring together, often in alternate layers, and sometimes in masses of great extent. In Nova Scotia, no deposit of rock-salt has actually been laid bare; but the gypsum districts furnish an excellent

salt brine, which is doubtless the result of the percolation of subterranean waters through beds of rock-salt, as yet unseen by man, and, perhaps, securely hidden forever from his eye.

A SUMMING UP.

It used to be fashionable for clergymen to divide their sermons according to the principal words of the text. Somewhat on this plan, we have preached our readers a long sermon, or series of sermons, taking for a text the National School of Mines. We have shown why it should be a *National*, not a State or individual enterprise; why it should be a National *School*, not a National Bureau; and why it should be a National School of *Mines*, and not of science generally, with mining included as a subordinate department. We have shown why it should be west of the Rocky Mountains; why it should be organized and governed as the STEWART bill proposes; and why it should be established now, that its beneficial influence on the bullion product of this country may be felt at an early a day as possible.

On the latter point we would dwell a moment. Such an institution would increase the production of bullion in three ways; first, by sending forth educated engineers, able to meet and overcome the growing difficulties of gold and silver mining and reduction; second, by affording information to thousands who are too old or too busy to receive thorough instruction, but who, being actively engaged in mining, most urgently require that counsel which will save them from unnecessary losses and disappointments; and finally, by making the capitalists of Europe, as well as America, acquainted with the mineral resources of our country, and drawing to our great mining regions that capital which (next to knowledge) is their prime necessity. If the Freiberg *Bergakademie* were planted this moment in the heart of our Pacific states, and its corps of trained teachers and active students were set at work examining and describing the capabilities of that region for successful mining, millions of foreign money would flow thither for honest investment.

But all these benefits must be, to some extent, of gradual growth. Freiberg Academies are not manufactured in a day. Corps of educated engineers are not to be made by merely conferring diplomas. *Therefore no time should be lost in making a commencement.* Our bullion product decreases year by year. If we wait until that decrease is really alarming, and forebodes financial disaster, it will then be too late to apply the rational remedy which would have saved us—which will save us, *now*.

STEALING AMONG MINERS.

Many mines, especially of gold, are liable to great and constant loss from thefts committed by the workmen. Ores which are treated by smelting are hardly worth stealing as "specimens," and in the furnace there is no chance for such operations. But gold, and sometimes silver, ores, which contain native metal, or are treated by amalgamation, are often so concentrated in value, as specimens, that they offer a temptation to dishonesty; and additional opportunity for stealing is given by the value and portable character of the amalgam. To prevent the abstraction of rich pieces of quartz from Nova Scotia mines, the Halifax *Mining Gazette* urges the following measures:

1. To procure the passage of an Act which shall make it unlawful for any one but a gold commissioner or jeweler to buy gold; and which shall compel the authorized buyers to keep a book wherein the address and other details shall be recorded, that will enable the seller to be traced. Nor should any gold be allowed to be bought unless the person offering it for sale could produce a certificate that he was the owner of a mine, and the specimens were really his own property. The price of the gold should be fixed, and any jeweller buying below that price, should be fined, and forfeit his license.
2. Proprietors should keep a descriptive register of every man employed.
3. A mining dress—to be supplied by the mine owner—should be worn by each man while at work.
4. A comfortable dressing and dining shed should be attached to each mine.
5. The men should be searched on ascending from the pits, and before leaving the works.
6. No man should be employed without a recommendation from somebody known to the manager.
7. The contractor should be held responsible for men introduced by him.
8. A portion of each man's wages should be kept in hand.
9. Men who may have served under one company for a whole year should receive a share, however small, from the dividends of the mine.
10. A black list should be kept and interchanged with managers in every district.

Rules so stringent could scarcely be enforced among American miners, yet the evil they are proposed to meet, certainly demands some attention.

Ross Browne.

We rejoice to hear that Mr. J. ROSS BROWNE, late U. S. Commissioner of Mining Statistics, is confirmed by the Senate as minister to China. Mr. BROWNE will fill that position with credit to the country and himself. Perhaps it may surprise some of our readers when we say, that we regret to lose him as Commissioner; yet such is our honest feeling. Mr. BROWNE'S first report, compiled in the short space of three months, and with all the disadvantages of his own inexperience, was extremely imperfect, and this journal took the lead in severe criticism upon it. Undisturbed by the censure he had provoked, except so far as he might gain some knowledge from it, the Commissioner entered upon the last year; and has shown himself to be in earnest in grappling with the difficulties of his task. The result of his labors is a great advance upon the first report. He has not only presented a picture of our mineral resources and the condition of our mining enterprise; but he has shown a just appreciation of their bearing upon our future prosperity, and, more than any other one man, he has created and vivified the plan of a National School of Mines.

Geometry in Nature and Art.

Mr. T. P. PEMBERTON will deliver a lecture on this subject before the Polytechnic Branch of the American Institute, next Thursday evening. The Institute meets weekly, in Room No. 24 Cooper Union, and as visitors are admitted free of charge and are agreeably entertained, the attendance is usually large. The next meeting promises to be very interesting. Mr. PEMBERTON is a ready speaker, and well acquainted with the subject of which he proposes to treat.

Typographical.

In our article of last week on Benson's Geometry, the name of Prof. DOCHARTY, of the College of New York, was printed DE CHARTY. The old definition of Fame—"having one's name mis-spelled in a complimentary notice"—is hardly appropriate to the case. Perhaps Prof. DOCHARTY will not thank us for this correction.

NEW PUBLICATIONS.

THE REPORT OF THE TWIN RIVER SILVER MINING COMPANY for 1867 shows the production of bullion during the year to have been $427,227 67 (gold valuation) at a cost of $326,971 51, leaving a profit of $100,256 16. Of this sum, $25,495 17 have been expended for hoisting-works and construction. The expenditures of the company from the date of its organization to Jan. 1, 1868, as per full returns attached hereto, have been $666,949 03 in gold, and $112,221 21 in currency; the total receipts for the same period were $509,224 10 in gold and $313,696 28 in currency. The statement of assets and liabilities shows a balance of assets over all claims of $54,588 33 in gold, or $76,423 66 in currency. This is exclusive of real estate, mill, machinery, buildings and roads. With regard to operations since the first of January, the trustees say, "With the beginning of the present year we had hoped that we should in a short time have been able to commence making dividends. Our outworks and necessary constructions being completed, and funds in hand nearly or quite sufficient to liquidate all debts, left nothing to be done but to lay aside all net earnings for that purpose; but owing to an unusually wet summer and fall, the supply of salt (needed for reduction) was insufficient to supply the increased demand which had been created by the increased number of mills in constant operation during the past year. Our agent was, therefore, obliged to go down the valley to Lone Mountain, and make new contracts for that indispensable article. It is satisfactory to know that at this point the supply is sufficient for all the wants of the State for generations to come; but is not so accessible at all seasons of the year as the deposit from which we formerly received our supplies, and where we shall obtain them again as soon as the dry season sets in. Owing to violent storms of snow and extreme cold, the contractors were unable to deliver any salt until more than thirty days after the time agreed upon as to its delivery. Consequently, our mill was idle more than twenty days during the month of January. Advantage was taken, however, of this stoppage, to make some necessary repairs, and the important work of developing the mine was steadily continued. Though the result of the year's operations has fallen much short of the expectations of the stockholders, the trustees feel that, notwithstanding all the difficulties they have had to contend against, a very respectable profit has been shown, and that with the improvements being introduced, and the advantages to be derived by the steady approach of the Central Pacific Railroad, they are warranted in expecting a much more profitable result in the future."

The report contains no statement as to the condition of the mine and other property, owing "to the fact that our former agent, Mr. R. B. CANFIELD, retired from the management of our works about the first of December, and that our present agent, Mr. S. S. ROBINSON, took charge at that time, and, owing to a press of duties, had not been able to make a report so soon after assuming the position he now occupies." This important statement may be received at an early day, and its presentation to the stockholders is promised.

The tabulated statements for 1867 show that mining work has been done as follows: Stoping, 678 fathoms; drifting, 574 feet; sinking shafts and winzes, 165 feet; at a total cost, for labor, of $53,835. The expenses of mining captains, timbermen, wheelers, trammers, sorters underground, landers, hoistage, pumping, blacksmithing, carpentering, timber, repairs, &c., raise the total mining cost to $106,310. To this are added—we omit cents—$6,511 for assorting and hauling, $156,000 for reduction, $18,720 for bullion charges, and $34,300 for general expense (including about $11,000 as salaries), making the whole mining expense at the mine $321,871 53. The mill was running 338½ days, at an average of 61.6 per cent. of its full capacity. The number of tons amalgamated was 3,847½; the average yield per ton $111 04.

The inconvenience and loss entailed upon almost all the Reese River mines by the failure of the salt supply during the winter just past, is well-known. So far as we are aware, only the Manhattan Company was provided with a surplus stock of that most necessary article. The wisdom and forethought of the agent of that company, in laying up a large supply in advance, at an expense of eight or nine thousand dollars, is greatly to his credit, and should be an example for the guidance of all producing mines hereafter. A still better measure would be the employment of adequate capital by the salt-contractors themselves, to secure at all times of the year a prompt and abundant delivery of that substance, the deficiency of which must immediately paralyse the industry of many districts. We trust this will be the last of the "unforeseen" occurrences which have intervened between the stockholders of the Twin River Company, and the dividends they have a right to expect.

THE REPORT OF THE CHIEF COMMISSIONER OF MINES FOR THE PROVINCE OF NOVA SCOTIA for 1867, (printed at Halifax) of which we have a few copies to spare at the office of this journal, is a highly business-like and valuable document. The commissioner considers the gold mines to have done well, the average remuneration of $2.44 daily, for each man employed, being, as he believes, "without a parallel in any country." The statistical returns are only brought to the close of September, 1867, and have been, to some extent, forestalled in our columns. We give, therefore, only a glance at the general tenor of the report.

The different districts are briefly mentioned; and we condense still further the commissioner's remarks upon them. Stormont—operations limited; Wine Harbor—a falling off in quantity and quality; Sherbrooke—second in quantity, but first in profit, averaging some $28 per ton for 5,809 tons of quartz; Tangier—on the whole, not a success; Montague—has fallen away, and is temporarily under much depression; Waverley—has lost its place as first, but still prominent and attractive; Oldham—never so well as in the past year; Renfrew—advances to the first place, and from being one of the poorest districts, has become the most productive, having yielded nearly 900 oz. of gold more than any other district; Lawrencetown—as yet insignificant; Uniacke—a new district; Ovens—no improvement in product, but quartz rich; Musquodobit, Killag, Mosher's River, Scraggy Lake, Upper Steiwacke, Gold River—discoveries, where little has been done. The abrogation of the Reciprocity Treaty by the United States caused a falling off in the production and sale of Nova Scotia coal, during the year ending September 30th, 1867, of 119,224 tons. The expectations entertained a year ago, that home consumption, and the growing markets of other provinces and colonies, would partially, if not fully make up the loss of the trade with the United States, have emphatically not been fulfilled. Neighboring colonies and home consumption have both decreased, instead of increasing. The total sale during the year was 482,078 tons. By the twenty-five accidents reported, nineteen were lost, and fifteen men were injured, who afterwards recovered. There were four colliery explosions, by which four men were killed and six injured. *The cause in every case was the introduction of naked lights into fiery mines.* The commissioner seems to be very accommodating in his verdicts—and, though he frequently ascribes a catastrophe to "carelessness," he does not often blame particular persons.

Scientific Meetings.

POLYTECHNIC BRANCH OF THE AMERICAN INSTITUTE.

The regular weekly meeting of the above Association was held last Thursday evening, at the usual time and place, with Mr. S. D. Tillman in the chair. The meeting was well attended, and was one of an interesting character. The chairman read some important notes on scientific matters, which were discussed by those interested in the various subjects. The most important feature of the evening's proceedings was the exhibition and description of

A PTEROTYPE OR TYPE WRITING MACHINE,

invented and patented by Mr. John Pratt, of Alabama. The machine was exhibited for the first time in this country, and was considered by all present to be one of the most useful and ingenious arrangements ever introduced here. The object sought for is to dispense with a great deal of hand-writing, and to have an apparatus which can be employed quickly and reliably, not only by business men, but also by all those who cannot employ the pen rapidly.

The machine, which is very light and portable, can print three hundred letters in one minute, and as the printing is executed on carbonized paper, by simply striking a few keys very much resembling those of a piano forte or organ, any operator with a knowledge of the arrangement of the keys, can print with almost as much facility in the dark as by daylight. By an automatic movement the paper, which hangs vertically, is moved at the completion of every line into a proper position for printing the next line. The machine reflects the greatest credit upon its inventor, on account of its practicability, usefulness, and general adaptation for all classes.

ARTIFICIAL GEMS.

On the subject of diamonds, Dr. Van der Weyde gave the following facts: Artificial gems are made of flint glass, and known as pastes. The Aliaska diamonds are made of the same material. An imitation of a $300 diamond can be made for $3, and no one can tell it from a genuine except by handling it. In selecting pastes, compare them with a real diamond, and the one nearest like the true gem will be always the best. Another way is to examine the stones with a strong glass, and if no air bubbles can be seen, then they are of the best quality, for in pure gems no imperfections are seen. Pure diamonds are unchangeable. Cheap stones, such as are sold "by the peck," are pressed when hot into the desired pattern, and then cut or ground. Twenty years ago artificial diamonds could be easily detected, as they were whiter than real gems, which have a peculiar dark transparency. Real diamonds are much colder to the tongue than artificial ones.

A REMARKABLE TREE—THE EARTH'S TEMPERATURE, ETC.

Prof. Tilman announced the death of a noted tree on the island of Teneriffe. Humboldt first brought this tree into notice, and he estimated it to be at least 6,000 years old. In speaking of the earth's temperature, one member said that at the depth of 40 feet the temperature is about the same in one place as in another, and in all seasons of the year. In the colder latitudes, however, the earth at the same depth is always frozen, and never thawing only on the surface. It is a startling fact, said he, that although flowers bloomed, and strawberries fruited, yet beneath them all the ground is eternally frozen. It has been proved that in Siberia the ground freezes to the depth of at least 800 feet. Prof. Tillman spoke of a large plate of glass just imported from France, which is 20x16 feet. It is easy to make large plates, but difficult to make them free from defects.

Professor Joy, of Columbia College, exhibited an ingenious parallel ruler for drafting purposes, the object of which was to lighten the labor of the draftsman in drawing section lines. Browne's Low Water Detector was also exhibited, a patent slate sponge, &c. After some further readings by the Chairman, the meeting adjourned, to meet next Thursday evening.

Correspondence.

[To insure insertion of correspondence in our columns, the full name and of the writer must be given.]

Scenery and Geology of the Orinoco Valley—The Venezulan Gold Fields.

EDITOR AMERICAN JOURNAL OF MINING:

Our route lay across the country from the Orinoco, S.E. by E. to the gold mines of the Uruari River. The distance by estimation—four hours of travel—was one hundred and thirty

miles. Leaving the river, we speedily ascended about two hundred feet, giving us one of the most lovely views of the grand hydrographical basin of the Orinoco that any one of our party had ever witnessed. Save the view of the valley of the St. Lawrence from the summit of Montreal mountain, I know of no river landscape that can equal it.

The rocks along the imediate shores of the Orinoco from the point where we first entered it—the head of the delta as high as Ciudad Bolivar, and according to Humboldt, far higher up—is hornblendic gneiss. Sometimes the hornblende is of dark color and in excess, giving an exfoliating character to any mass on exposure to atmospheric agency—the mass resembling the boulders of northern latitudes. The dip is vertical, and the direction N.E., SS.W. We rode on this kind of rock for three hours, occasionally seeing patches of quartz conglomerate, cemented by oxide of iron, resembling the oil-bearing conglomerate of New Granada. The analogy between the two is more strongly brought out lower down the Orinoco, where oil issues from the same kind of rock, and coal is found on the island of Tortola, in the river opposite Piacoa. The dip of the gneiss about this time began to change, being about 70 or 80 degrees S.E., while at the river it is vertical. The first range of hills had long been in sight—the San Felix. The spur we crossed was sand-stone and conglomerate, rising into conical hills, three or four hundred feet above the savanna we had been crossing. The next spur was porphyritic sandstone, judging from masses by the way-side. These secondary rocks I judged to lie in depressions of gneiss, for speedily after passing them we found this rock again. Already had we noticed signs of auriferous belts of quartz in gneiss, both by color of decomposing rock and general aspect of the veins. On inquiry, we found that the precious metal had been found by panning along the Upata river, which lay closely. Each savanna we crossed lay higher than the last. The second range of hills are called the Wakemi, more rugged and higher than the last; the paths around their spurs sharper, steeper, and rocky. Beyond Wakemi lay a higher rolling savanna reaching to the mountains of Mauri, which seemed to be the culminating range, about 2000 feet above the sea. From the second to the third range we saw no other rock than gneiss. Numerous old mines, with shafts and adits, are found through the country in this rock, apparently having been made in search of argentiferous galena. The three ranges of hills we have crossed are considered to be but subordinate to the longer range of Sierra Piacoa, running N. 75, E. from the mouth of the Rio Imataca to the Coroni river, and forming the southern run of the Orinoco basin, and is probably but a portion of the Serrania Imataca coming in from British Guayana.

At the point where we crossed the rim of the Orinoco valley, we were about 1,500 feet above the sea, still on rolling savanna, with hills rising three to five hundred feet higher, the rock still gneiss, dipping S.E. about 45 to 50 degrees.

From the southern aspect of this table-land, looking along the course of the Piacoa range, the elevation seemed as if done by fracture; but the comparative gentle slope of the range, and the equally gentle slope of the gneiss, and especially finding other rock at the base, led me to infer a fold of the strata rather than fracture. The southern portion of the valley of the Orinoco is here but five leagues wide, while north it is thirty leagues. The Cuyuni basin, an affluent of the Essequibo, is full fifty leagues wide, reaching southwards to the Serrania Pacaraima, separating Venezuela from Brazil.

The Orinoco Valley, so far as we have seen it, and can learn from others who have travelled through it in its lower portion, from the mouth of the Assure, is much better adapted for grazing than culture. The soil, being for the most part derived from decomposed gneiss rock, is hard of cultivation, sterile and barren. Along the river-courses and intervals of mountain slopes, rich bottom lands are found in narrow stripes, which grow cotton, yuca, corn, rice and sugar in profusion, while the hills produce coffee of excellent flavor.

To return to the geology of the country:—On descending from the terro of St. Maria itself, a portion of the Piacoa range, we found ourselves on quartzite rock of great extent and volume. The savanna of Cume, which we had entered, stretched east and west as far as the horizon, and was fifteen leagues across in a south-east direction. Quartzite floored the whole of it, sometimes rising into low, smooth knobs, as in the southern gold States, at others stretching in gentle plains. In one instance, Cerro Chaguramal, it rose into a range of hills five hundred feet high, and running three or four miles. The south side of the savanna was bounded by Santa Cruz mountain, which, judging from exposure on the east end, was mainly composed of quartzite, with bands of gneissoid granite, and silicious slates. The latter, observed at one point, had a thickness of a thousand or more feet, dip S.E. 80 degrees, course N.E. by E. From the St. Cruz range on to the Uruari river, gneiss occupied the country, much decomposed, offering mottled and highly variegated exposure, with large and frequent bands of quartz. All along, for the last thirty leagues, we had seen signs of gold, and were more confirmed in our observations on inquiry, that gold had been found in many of the Cerro's and Arroyas. Before arriving at Gucipati, our headquarters, we saw rising boldly from the savanna the gold mountains of Caratel, Chili, Potosi and Panama, lying south of the Yusuara river. Their sharp, clear outlines, range lying beyond range, all made distinctly visible by mists hanging over their valleys, formed a very agreeable boundary to the southern horizon, and told us we had arrived at the termination of our tedious mule journey, and soon were to enter upon the more agreeable labors of exploring and discovery—of testing and examining, and learning of the hidden wealth of the gold ranges.

We had travelled from the Orinoco, over savannas, with belts of timber bordering the streams, as on the great plains of our country; but beyond us southward is one interminable forest, untrod by civilized man, until you enter far into the confines of Brazil. Then, as the wild Indians say, who carry their articles of trade to the Amazon, the savannas reappear, and extend to the wooded belt of the valley of the Amazon.

How far we shall penetrate these forests, what ranges cross, what rocks we see, what the promise of auriferous wealth—you shall hear in future numbers. S.

☞ In the process of making paper from wood, as practiced in Europe, round disks of wood are first subjected to the action of hydrochloric acid to dissolve out the spungy cellulose. This latter has, until lately, been a waste product, but is now converted into alcohol in this way. The wood is boiled for twelve hours in hydrochloric acid, diluted with ten times its volume of water. The acid liquid, which is charged with grape sugar formed from the spongy cellulose, is then withdrawn, the excess of acid saturated with lime or chalk, and a small quantity of yeast is added, the temperature being kept at about 68 Fah. Fermentation soon ensues, and when bubbles of carbonic acid gas are no longer evolved, the liquid is distilled to obtain the alcohol.

Temperature Scale and Hydrometer.

The annexed engravings represent a hydrometer and a thermometer, used more especially for the purpose of ascertaining the strength and temperature of spirits and distilled liquors. The Hydrometer, fig. 1, is graduated in conformity with the standard now used by the United States Government, and is used by the inspectors appointed by the collectors of internal revenue under the new national tax law of 1862 and 1866. The thermometer, fig. 2, is graduated to agree with the hydrometer. P, on the stem of the hydrometer, is the mark for proof, when the liquor is 60° Fahrenheit's thermometer, at which temperature the instrument is graduated.

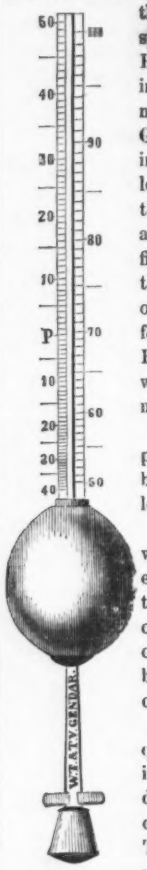

FIG. 1.

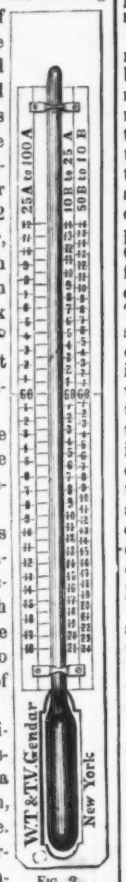

FIG. 2.

Every line above the P, is one per cent. above proof. Each line below the P, is one per cent. below proof.

For every degree the liquor is warmer than 60 by the thermometer, one per cent. is to be deducted from the indicated strength of the liquor, and for every degree of temperature below 60, one is to be added to the strength or proof of the liquor.

An increase of heat causes liquids to expand in volume, causing the hydrometer to sink and a decrease produces contraction, causing the hydrometer to rise. Therefore, spirits over the normal temperature of 60 Fahrenheit's thermometer, appear stronger than they really are, and below 60 they are really stronger than they appear to be. This difference is compensated by the use of the specially graduated thermometer.

The thermometer accompanying this instrument is divided into three columns representing the three different ranges of liquors, and marked at the top.

25 A, (above) to 100 A, (above,)	10 B, (below,) to 25 A, (above,)	50 B, (below,) to 10 B, (below,)

distinctly indicating which column is to be used in testing the strength. The column on the left, 25 A to 100 A, is divided at the ratio of 6 for each 20 degrees of Fahrenheit's thermometer, the middle column, 10 B to 25 A, at the ratio of 7; and the column at the right, 50 B to 10 B, at the ratio of 8 degrees.

The manner of using these instruments is as follows:

Note the number of per centages *above* or *below* P, at which the spirit under trial *cuts* the graduated *stem* of the hydrometer, then, from the number of per cents thus *cut, subtract* as many degrees as the mercury stands *above* 60 on the thermometer, or *add* to the number cut on the stem as many degrees as the mercury stands *below* 60 deg., and thus will the true strength be ascertained.

Suppose the hydrometer sinks to 32 on the stem, and the thermometer shows 6 above 60 on the left column, then 6 per cent. is to be deducted from 32, (the indication on the hydrometer,) leaving 26 above, which is the strength of the liquor; but should the temperature be 6 below the 60, the hydrometer being 32, then 6 per cent. should be added, making the proof 38 above. Again if the hydrometer stands at 32, and the thermometer shows 10 above 60 on the same column, that would indicate that the liquor was less than 25 above, then the middle column should be used, which would give 11 to be deducted, making the strength 21 per cent.

Suppose the spirit under examination cuts the stem at 35 above P, and the mercury stands at 7 *above* 60 on the left column, (which is to be used for that strength, then 7 is to be *deducted* from the apparent strength of 35 per cent., leaving 28 per cent. above P, which is the strength of that spirit; but should the mercury stand at 7 *below* 60, the hydrometer indicating the same strength, (35 above P,) then 7 is to be *added,* making that spirit 42 per cent. above P.

Or, the hydrometer rests in the spirit at 7 below P, and the mercury stands at 8 *below* 60 on the middle column, then 8 is to be *added,* bringing it to 1 per cent. above P.

Again, the spirit under trial cuts the stem at 28 above P, and the mercury stands at 8 *above* 60 on the left column, which would indicate that the middle column should be used for that strength, which will give 9 to be *deducted,* making ths strength of that spirit 19 per cent. above P, instead of 28, and in like manner for any other strength at any temperature on the scale.

These instruments are manufactured by W. T. & T. V. Gendar, 87 Fulton street, New York City.

Manufacturing and Mechanical Notes.

No. XI.

Thermometers.

In its general relations heat is of the utmost importance in the system of nature. The existence of life, both vegetable and animal, is dependent on it; it determines the dimensions of all objects, regulates the form they assume, and is more or less concerned in every chemical change that takes place. Every object to which we have access possesses a certain amount of heat, and so long as it remains at common temperatures, may be touched without pain; but if a larger quantity of heat is given to it a sensation of burning is immediately produced. To determine, therefore, with precision the quantity of heat which is present in a body when it exhibits any particular phenomenon, it is necessary that we should be furnished with some means of effecting its measurment.

The name thermometer is derived from two Greek words, meaning *heat measurer.* It was invented about the year 1600; but, like many other inventions, the merit of its discovery is not to be ascribed to one person, but to be distributed among many. When moderate temperatures are to be ascertained the thermometer is employed, but pyrometers are used for determining the more elevated degrees of heat. Of thermometers we have several different kinds. Some are made of solid substances, others of liquids, and others of gases. With a few exceptions, they all depend on the same principle—the expansion which ensues in all bodies as their temperature rises. Of these the mercurial thermometer is the most common, and for the purpose of science the most generally available. It consists of a glass tube with a bulb on its lower extremity. The entire bulb and part of the tube are filled with quicksilver, and the rest of the tube, the extremity of which is closed, contains a vacuum. This glass portion is fastened in an appropriate manner, upon a scale of ivory or metal, which bears divisions, and the thermometer is said to be at that particular degree against which its quicksilver stands on the scale. The thermometer known as Fahrenheit's has the intervals on the scale, between the freezing and boiling points, divided into 180 equal parts. This division is similarly continued below the freezing point to the place 0, called zero, and each division upwards from that is marked with the successive numbers, 1, 2, 3, &c. The freezing point will now be on the 32d division, and the boiling point will be the 212th division. These divisions are called degrees, and the boiling point will therefore be 212°, and the freezing temperature 32°.

Thermometers of this character are called Fahrenheit's, from a Dutch philosophical instrument-maker, who first introduced this method of gradation in the year 1724. In addition to Fahrenheit's thermometer, two others are extensively used, which are known as Reaumur's, and the centigrade thermometer, or thermometer of Celsius.

The only variation between these three kinds of thermometers is the difference in graduating the interval between the freezing and boiling point of water. Reamur's is divided into eighty degrees, the centigrade into one hundred, and Fahrenheit's into one hundred and eighty. According to Reaumur, water freezes at 0° and boils at 80°; according to Centigrade, it freezes at 0° and boils at 100°; and according to Fahrenheit, it freezes at 32° and boils at 212°, as previously explained. In England, Holland, and the United States, the thermometer most generally used is Fahrenheit's. Reaumur's scale is used in Germany, and the centigrade in France, Sweden, and some other parts of Europe. The scale of the centigrade is by far the simplest and most rational method of graduation. As the temperature is lowered, the mercury in Fahrenheit's thermometer gradually sinks, until it reaches a point 39° below zero, where it freezes. Mercury, therefore, can not be made available for measuring cold of a greater intensity. This difficulty is, however, obviated by using a thermometer filled with alcohol colored red, as this fluid, when pure, never freezes, but will continue to sink lower and lower in the tube as the cold increases. Such an instrument is called a spirit thermometer.

If a Fahrenheit's thermometer be heated, the mercury contained in it will rise in the tube until it reaches 660°, at which temperature it begins to boil. A slight additional heat forms vapor sufficient to burst the tube. Mercury, therefore, can not be used to measure degrees of heat of greater intensity than 660° F. Temperatures greater than this are determined by means of the expansion of solids, and pyrometers are constructed upon this principle. A thermometer does not inform us how much heat any substance contains, but it merely points out the difference in the temperature of two or more substances. It must be remembered that degrees are part of an arbitrary scale, selected for convenience, without any reference whatever to the actual quantity of heat present in bodies.

The Precious Metals.

CONTINUED FROM 182.

The introduction of steam in mills, boats, and cars has doubled the produtive capacity of mankind, and far more than doubled the demand for money. The speedy and cheap communication between all countries has added vastly to the general wealth, and has increased the demand for the representatives of wealth. The remotest part of the world are now brought to our doors, and China and Hindostan open their laps to receive our gold and silver, and prevent it from falling in value by becoming too abundant in our hands. One of the best indications of the increase of trade and the spread of civilization is the relative value of the precious metal, and we see that a net increase of $500,000,000, or an addition of 250 per cent. to the stock in the sixteenth century trebled prices in half a century, while a net increase of $5,300,000,000 or 900 per cent. since the year 1600, has not trebled prices in the last two hundred and fifty years.

INFLUENCE OF INCREASED PRODUCTION ON NATIONAL DEBTS.

But whatever may be the relative position of the two metals, it is very certain that the time is not far distant when the price of the two as compared with other products of human labor must fall. They are now increasing more rapidly than is the demand for them, and at the present rate of increase they would soon have to begin to fall perceptibly; but the production will become much greater than it is. The vast improvements that have been made both in gold and silver mining within the last twenty years are applied to only a few mines, and the rewards for those who introduce them into other parts of the world are so large and so certain that the introduction cannot be delayed to any remote period. If all the argentiferous lodes of Mexico, Peru, and Bolivia known to be rich were worked with the machinery used at Washoe, their yield would really flood the world. The placers of Brazil, exhausted for the slow processes known a century ago, will yield treasures greater than ever produced before. The hydraulic process is needed in Liberia, and in Africa, and in many placers as worked out thousands of years ago. New deposits of silver will be found, and the innumerable rich lodes on the Pacific slope of the United States not yet opened will be worked with a profit. The mining processes are now being studied by numerous learned and able men, and improvement after improvement will be made in the mode of reduction.

The inevitable fall in the value of the precious metals will be a benefit to mankind generally. It will reduce the wealth of the rich and the debts of nations. The dollar of debt which represents the day's work of a common laborer will, before the end of the century, represent only four-fifths, perhaps only two-thirds of a day's work. Thus the national debts now existing will be

reduced twenty or thirty-three per cent., the interest as well as the principal. The decrease, however, will be so slow that it will scarcely be felt by any one person; so the general public will be benefited, while individuals will lose little.

Chevalier thinks that Government should do all in its power to keep the relative value of a dollar at the present standard; but it would be hard to find any good reason for such a policy. It may do very well in European monarchies, where it is considered wise policy to preserve wealth in those families which have it now; but in the United States our custom and our law favor the individual rather than the family. We have no nobility, no princely salaries for officials, no hereditary titles, no social reverence for blood, no primogeniture, no law of entail, no hampering of the sale of real estate, no restriction of education to the wealthy, no exclusive governmental favor for the rich. We are accustomed to see the rich become poor, and the poor become rich, and we are proud of our country, because here the career is open to talent, while in Europe it is, comparatively speaking, open only to hereditary wealth. Most of the rich men of Europe are the sons and grandsons of rich men; in the United States the rich men are mostly the sons and almost invariably the grandsons of poor men. We are then not frightened to think that those families which held large sums in Government and other bonds should be poorer in half a century than they now are. The amount of bonds outstanding to be paid by the United States for national, State, county, city and railroad debts, is not less than $5,000,000,000, and a reduction of fifty per cent. in that debt by a fall of fifty per cent. in the value of gold and silver will be a vast benefit to the nation. Chevalier assumes that gold will fall; and he urges France to make silver the only legal tender, so that the loss to the bond-holders and the gain to the Government may be as little as possible. He says that if both metals remain legal tender, as at present in France, debtors will pay in whichever proves to be least in value. It may be worthy of consideration whether our Government, looking at the matter from a different standpoint, should not make both metals legal tender, so that the Government shall have the benefit of any change in relative value.

Patent Claims.

Interesting to Miners, Millmen, Metallurgists, Oil-Men, and Others.

75,240.—PROCESS OF PURIFYING IRON AND STEEL.—Jno. F. Bennett, Pittsburg, Pa. Antedated Feb. 28, 1868.

I claim the use of carbonic acid gas, either alone or mixed with atmospheric air, or with other gases or vapors, when introduced into the body of molten iron or other metal, in combination with or immediately following the pneumatic process, for the purpose of removing sulphur, phosphorus, and any other impurities which will form chemical combinations with the oxygen of the carbonic acid, and deposit the carbon substantially as hereinbefore described.

75,289.—PROCESS OF TREATING GOLD BULLION TO TOUGHEN AND REFINE IT.—F. B. Miller, Sydney, New South Wales.

I claim the process of refining gold by applying chlorine to it while in a molten state, substantially as hereinbefore set forth.

75,293.—PROCESS OF EXTRACTING THE PRECIOUS METALS FROM ORES. Adolph Ott, New York City, assignor to Antonio Pelletier, Washington, D. C.

I claim, 1st. Roasting sulphurets, tailings, and residua from other treatments, either alone or mixed with chemicals, in the progressive and continuous manner herein described.

2n. In the roasting process of the ore or tailings, the use of chloride of iron, copper, or magnesium, and of hypochlorites of an alkaline, earthy, or metalic base, mixed with the ore or tailings, and employed as specified.

3d. The introduction of hyponiferous acid gas, or oxygen gas, obtained as set forth in the roasting process.

4th. Precipitating precious metals from a solution of their soluble salts, by means and with the use of the sulphuretted hydrogen gas produced in the process of roasting said ore, or by a solution of the same in water.

5th. The extraction of silver, or of silver and gold, from the roasted ore, by means and with the use of the double sulphite of an alkaline base (KO $2SO_2$, or NaO_2 $2SO_2$,) and of the hyposulphites of an earthy or metalic base, in the manner specified.

75,294.—APPARATUS FOR EXTRACTING PRECIOUS METALS.—Adolph Ott, New York City, assignor to Antonio Pelletier, Washington, D. C.

I claim, 1st. The ore roasting furnace, A, composed of a series of ovens, C, D, E, with alternate flat and depressed hearths, in combination with the shaft, I, arms L L' L'' flues, P P' P'' P''' P'''', flues, M and N, and chambers, R and F, arranged and operating as set forth.

2d. In an oven for roasting ore, the flue, S, and tank, T.

3d. The combination of the flue, U, holes, V V V V, and ovens, C D E, with the pipe, x and y.

4th. The apparatus, B, composed of the apparatus, a, tank, b b b, and strainer, h, arranged together and operating as specified.

75,355.—WELL BORER.—Geo. W. Bowen, Fort Wayne, Indiana.

I claim, The circular plate, D, for well cleaning, when provided with holes, a, for the purpose of allowing the escape of water from the dirt or sand, being lifted from the well, as herein set forth for the purpose specified.

2. The plate, D, having spring cutting edges, all formed in one piece and provided with holes, a, as and for the purpose specified.

3d. The application of the ropes to the plate, D, for the purpose of elevating the tool from the well, as and for the purpose specified.

4th. The tool for cleaning wells, constructed as described, consisting of the perforated disk, D, having spring cutting edges, surrounded by the rim, F, and provided with adjustable handle, A B, as herein shown and described.

75,415.—FURNACE FOR SMELTING ORES OF LEAD AND OTHER METALS.—R. Henry Hall, Taunton, Mass.

I claim the application of a receiving basin, as herein described, to furnaces used for smelting ores of gold, silver, or lead.

75,442.—MODE OF PRODUCING HOT BLAST IN FURNACES.—Theodore McDowell, Light street, Philadelphia, Pa., assignor to T. McDowell and A. McDowell.

I claim the engine, C, pump, c, pipes, I, vessels, F, and chamber, H, when combined substantially as and for the purpose explained.

RE-ISSUE.

2,893.—HYDROCARBON VAPOR APPARATUS.—F. S. Pease, Buffalo, N.Y. Patented March 13, 1860.

I claim, 1st. The combination of the box, A, one or more pans, B, for containing hydrocarbon liquid, the supply pipe, C, at or near the top, the exit pipe, D, at or near the bottom, and the condenser, E, the whole operating substantially as and for the purposes herein set forth.

2d. Condenser, employed in connection with an air carbureting apparatus, substantially as and for the purposes set forth.

3d. The combination with the pans or trays, B, of the perforated plates, b, through which the air passes in its course through the carbureting chamber.

Special Scientific Brevities.

☞ Recent experiments by L. Cailletet confirm those made many years ago by Morren, of France, with regard to the influence of the luminous rays in vegetable growth. The former advances a step further by including the red, as well as the yellow ray, among those most favorable in promoting the decomposition of carbonic acid gas by plants. All the rays more refrangible than the yellow are powerless in this respect. Under the influence of green light, not only does no decomposition take place, but new quantities of carbonic acid are formed, the exhalation of the gas by the fresh leaf being nearly as much under this condition as when placed in the dark. Light passed through a solution of iodine in bisulphide of carbon, prevents decomposition of the acid, and the appropriation of carbon by the plant, but does not seem to increase the quantity of acid, which might be inferred from the fact that the violet is the most refrangible of the colored rays. Many experiments have been made in this country which give the same general results of those of Morren and of Dr. Daubeny, of England, but differ somewhat from those of Caillette.

☞ For the prevention and cure of certain diseases, traceable to dietetic errors, Dr. Lankester adds to common table salt (chloride of sodium,) small proportions of phosphate of lime, chloride of potassium, sulphates of potash and soda, and still smaller, of magnesian and iron salts. The object of the inventor will be known by stating that consumption, scrofula, and softening of the bones are supposed to result from a deficiency of phosphate of lime and other salts; scurvy, from the absence of potash; and nervous disorders from a want of iron in the blood. This plan of guarding against human ills generally by a single condiment, reminds one of the early attempts to drive off disease, before a proper diagnosis, by administering a compound of numerous medical roots, in the hope that at least one of them would meet the case and prove an antedote; while all the remaining ingredients, finding their services not required, would reserve their force and quietly withdraw from the contest, or at least produce no pernicious effect upon the patient.

☞ Mr. Alfred Tribe has been experimenting with bismuth, to ascertain the correctness of Professor Tindall's statement that the anomalous expansion of water in the act of cooling below 40 deg. C., or 39.2 deg. Fah., is by no means an isolated instance of the kind, but that other bodies, and particularly molten bismuth, participate in this extraordinary property of expanding near the point of solidification. Mr. Tribe, in a paper read before the London Chemical Society, expresses the opinion that the analogy between water and bismuth is imperfect, since in the case of molten metal, there is no perceptible range of temperature through which it expands on cooling. The act of solidification is itself accompanied by an increase of bulk, but there is no evidence of this expansion taking place prior to the act of crystallization.

☞ M. Balsamo has presented to the French Academy a battery, both elements of which consist of iron, the one being immersed in a solution of chloride of calcium, the other in diluted sulphuric acid, the two solutions being separated by a porous cell. The iron in the sulphuric acid acted as the positive element, and the other as negative. A constant and quite an intense current is obtained by this arrangement. Another novel battery, termed an "electric buoy," is now being experimented upon at Cherbourg. It consists of a zinc plate and a cylinder of carbon, attached to a cross-piece of wood, having sea water as an exciting liquid. Still another variety is that of M. Miergue, of Bonfarik, consisting of a cylindrical cell of porous carbon, containing nitric acid, and an exterior cylinder of amalgamated zinc in a cell full of water.

☞ At the Atlas Steel Works, Glasgow, a very neat contrivance has for some time been used for enabling the observer to determine the point when the combustion of the carbon is completed. A square thin frame contains a combination of colored glasses; for instance, one dark yellow and two blue, or any other colors giving together a very dark neutral tint. Looking at the flame through these glasses, affords the double advantage of preserving the eye from the unpleasant effects of the intense light, and of making all smoke and other disturbing changes invisible. The flame, when thus viewed, looks white so long as the intense brilliancy due to the burning up of the carbon continues, but changes to a deep red at the moment all the latter has been consumed.

On-dit about Minerals, &c.

☞ The area of the anthracite coal fields, together with the thickness of coal measures are stated as follows:

Regions.	Area in miles.	Thickness in feet.	No. of acres.
Schuylkill	180	100	115,200
Lehigh	44	50	23,160
Shamokin	50	70	33,000
Lackawana	100	60	64,000
Wyoming	98	100	62,720

☞ The Mahoning *Register* says: "We constantly hear of new manufacturing enterprises in the Mahoning Valley. Among others, a company has been formed to erect iron works at Mahoningtown, near the junction of the Lawrence and Erie and Pittsburg railroads. The ground has been presented to the company by the citizens, and work is to be begun in the spring. The principal object is to manufacture spikes, one of the stockholders being proprietor of a new patent spike machine."

☞ A company has just been organized in Chicago, called the "Chicago Iron Company," for the purpose of constructing two blast furnaces near that city, with a capacity of fifty tons per day. The iron ore of the Lake Superior region will be smelted with the coal recently discovered in Central Illinois, which has been tested and found to be well adapted to the purpose of iron making.

☞ The new Bellaire Iron Works, at Bellaire, Ohio, which began operations less than a month ago, were destroyed by fire on the 16th ult. The loss is estimated at $50,000, and there was insurance to the amount of $42,000. Most of the machinery was saved. The works cost $160,000 and were run on the co-operative system. They will be re-built at once.

☞ Three new furnaces are to be built in Danville, Pa., during the next summer. One will be erected by the Pennsylvania Iron Company, one by the National Iron Company, and one by Grove Bros.

☞ Last year the aggregate product of coal oil in Michigan was about 25,000 tons, representing a value of $87,500, and the business is increasing.

All Sorts.

☞ An experiment was recently made in blasting the ice at a point opposite the steamboat landing, Albany, with a tin case containing seven pounds of powder, placed beneath the ice. The experiment did not result satisfactorily, as only about ten feet of ice were broken, instead of an acre or more, as had been anticipated.

☞ A new system of steam heating has been put in operation in Boston. It is a system in which water is boiled by the heat furnished by ordinary gas burners, and it is reported that it is in operation in, and thoroughly warms a Roston store, forty by eighteen feet, using only a half pint of water and two gas burners.

☞ The highest inhabited place on the globe is the post-house of Ancomarco, in Peru, which is nearly sixteen thousand feet above the sea.

☞ Between eighty and ninety millions pins can be made in a day of ten hours, by a machine lately completed at Hartford, Conn.

☞ Last year the aggregate yield of coal oil, in Michigan, was about 25,000 tons.

☞ A lead Company of Portland, Maine, furnishes about 2,000,000 lbs. of acids annually.

☞ St. Paul, Minn., sent eighty thousand rat skins to Europe, in one lot, last month.

☞ New towns are springing up with magical celerity along the Union Pacific Railroad.

Special Notices.

Blake's Crusher.

In the notice of this machine that appeared in last week's JOURNAL OF MINING, we stated that one was to be seen in operation at the Central Park in this city, which is not the case, as it has been removed from there, having completed its task. We, moreover, stated that sixteen corporations in Massachusetts *are about* to introduce them for road purposes, when we should have said that they have *already adopted* them. A desire to be correct in all our assertions prompts us to make this correction. In our next issue we shall have more to say about this machine as regards its availability in our mines.

Removal.

The office of the Novelty Iron Works has been removed from No. 111 Broadway to No. 79 Liberty street. The attention of our readers is directed to the advertisement of these works, which appears in another column. They are fully prepared to fill in a satisfactory manner contracts for all kinds of mining and other machinery.

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SAFETY HOISTING MACHINERY,
feb15:6m 309 BROADWAY, N. Y. CITY.

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BROKER IN PIG IRON, AMERICAN AND FOREIGN.
dec7:tf 66 Wall Street, New York City.

WANTED.—A Mining Engineer to prospect a tract of land in Central Canada. Work to begin 15th May, or earlier if season permits. No humbugs need apply. Address J. B., Drawer 448, Kingston, Canada. mar7:1t

AN EXPERIENCED MECHANICAL DRAUGHTSMAN AND PRACTICAL ENGINEER wants a situation.
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mar14:4t

FOR SALE
1 BOGARDUS QUARTZ MILL,
1 LARGE SIZE HEPBURNS & PETERSON PAN.
Apply at the MANHATTAN METALLURGICAL WORKS
552 & 554 West Twenty-eighth street.
:3m

1868.
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mar21

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ECONOMY,
DURABILITY,
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furnished for all kinds of Mills, made on Mechanical principles, under my personal supervision, having had long experience. Circulars sent free.
GEORGE TALLCOT,
mar12:67.1y No. 96 LIBERTY STREET, New York.

60th AUCTION SALE.
75,000 TONS SCRANTON COAL,
On WEDNESDAY, March 25th, 1868.

NEW YORK, March 18, 1868.
The Delaware, Lackawanna and Western Railroad Company will sell, by Messrs. JOHN H. DRAPER & Co., Auctioneers, at the Company's Sales Room, 26 Exchange Place, corner of William street, New York, on Wednesday, March 25th, at 12 o'clock, noon,
75,000 TONS OF COAL,
From the Lackawanna Regions, of the usual sizes, deliverable at their Depot, Elizabethport, N. J., during the month of April, 1868.
The sale will be positive, each lot put up will be sold to the highest bidder; no bids, in any form whatever, being made for account of, or on behalf of the Company. The conditions will be fully made known at the time of sale.
Terms: Fifty cents per ton, payable in current funds, on the day of sale, and the balance within ten days thereafter, if required, at the office of the Company.
mar21:1t SAMUEL SLOAN, President.

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WANTED, a Party who understands Cleaning or Separating American Plumbago from its impurities, in large quantities, either by washing or otherwise.
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mar21:2t No. 333 Coates street, Philadelphia.

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mar21-3m MANUFACTORY, 183 Delancey street, N. Y.

D. P. DAVIS, CONSULTING AND SUPERINTENDING MECHANICAL ENGINEER, Office, 26½ Broadway, Room No. 5. mar21-1m

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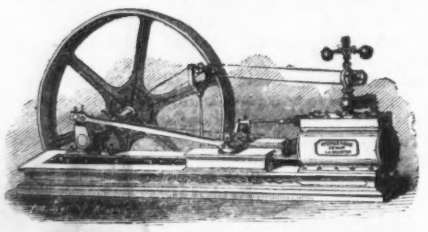

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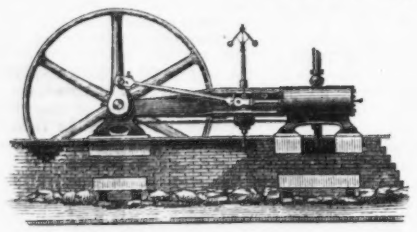

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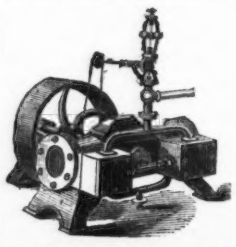

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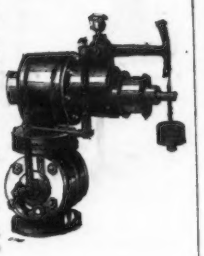

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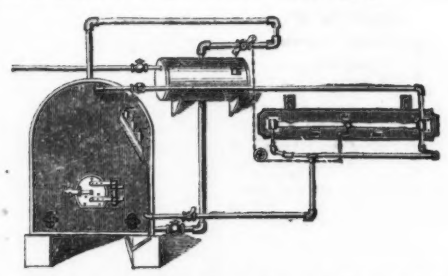

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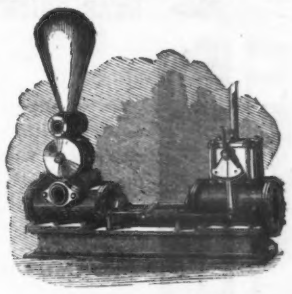

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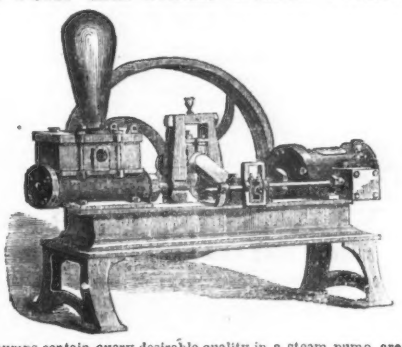

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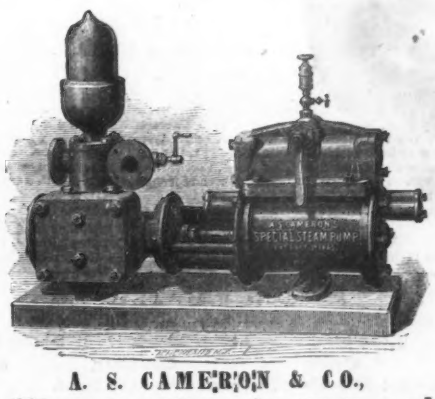

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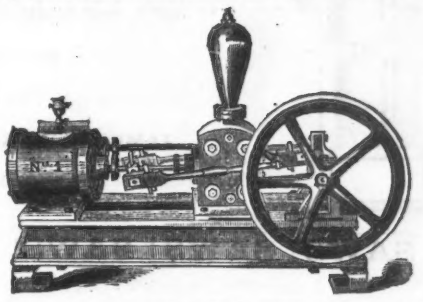

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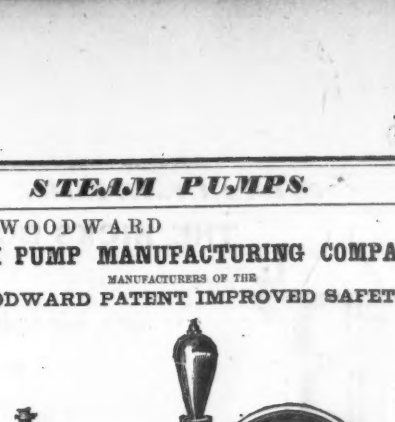

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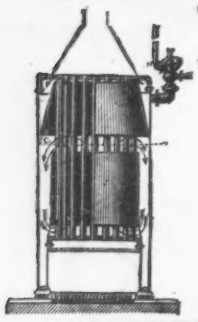

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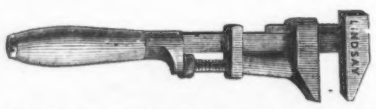

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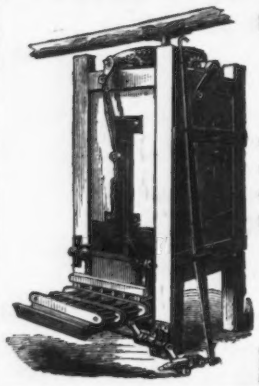

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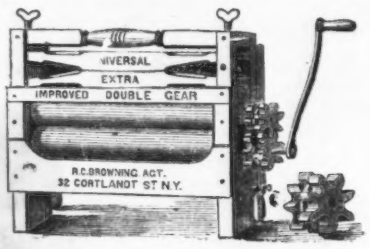

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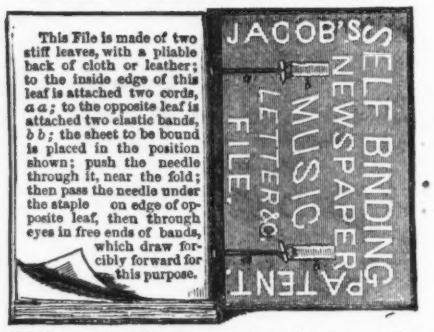
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PUBLICATIONS.

PROSPECTUS.

EL CORREO HISPANO-AMERICANO;

A Journal of Commerce, Agriculture, Mining, Mechanics, Railway Enterprise, &c., especially devoted to the interests of the Spanish American States, issued the 1st, 10th and 20th of Every Month.

The much-to-be-regretted absence of adequate commercial intercourse between the Northern and Southern continents of America is mainly to be attributed to two causes. The first of these is the lack of proper information, among the industrial and agricultural classes of the Spanish American Republics, concerning the facilities and advantages offered by the manufactures of the United States; and the second is the entire absence of direct communication between the producers of this, and the consumers of those nations; while those who are really aware of the favorable opportunities here offered are deterred from availing themselves of such advantages by the fact that the expense of importations is not infrequently tripled or quadrupled by the passage of merchandise through three or four hands before reaching its final destination. England and France have commanded hith erto the markets of South America for all kinds of manufactures, while th United States, excelling in almost every department, and offering in addition the inducement of low prices, have enjoyed but a small share of the trade. Few manufacturers in this country are aware of the vast extent and profitable nature of this commerce; but the conviction of this fact is rapidly making itself felt; and there is urgent inquiry for the proper means turning this tide, which now flows to Europe, towards the shores of Northern Continent. The possible acquisition by the United States, at remote day, of an important foothold among the Spanish American islands gives the subject at the present time great additional importance. Our naval supremacy in those regions should be accompanied by the commercial supremacy which it is chiefly useful to defend.

The best and surest means to this end is to furnish the Spanish American consumer with full and accurate information regarding the commerce, manufactures, mechanical arts, mining, metallurgy, railways, &c., of this country, setting forth in these departments our superiority to the nations of the Old World, and explaining the advantages offered in our markets.

Our conviction of the usefulness of such a step, based upon long and careful examination of the subject, and thorough personal acquaintance with each one of the Republics in question, their resources, interests and requirements, has received, of late, additional confirmation from communications addressed to us, as Publishers of the AMERICAN JOURNAL OF MINING, by prominent and influential citizens of Mexico and the other Hispano-American Republics, pointing out the expediency of either translating our Journal into Spanish, or publishing a periodical in that language for circulation in those countries. These gentlemen have urged us to put the plan into immediate execution, and promised us their influence and personal support.

We have therefore resolved upon the issue of "EL CORREO HISPANO-AMERICANO," for the purposes set forth above; and we feel assured that the nature of the Journal itself, together with the facilities we possess for its publication, and the patronage already spontaneously offered and secured, will render it not only the best medium of publicity for the manufactures of the United States, but one which cannot be superseded in point of universal circulation, efficiency of advertising, and economy of terms.

It will at once be evident, that the "CORREO HISPANO-AMERICANO" will not, like newspapers in general, depend upon partisan or political beliefs for its popularity. Politics having no place in its columns, it will have no rivals, will be free from all shackles of party spirit or interest, and will be welcomed in all circles and by all classes as a real friend, the bearer of useful information on matters of vital interest to all. Hence, it cannot com into competition with political journals of the day.

Besides the matters of value to the Spanish American reader already enumerated, the CORREO will contain the most complete market reports, including the prices of all crude and manufactured materials in the production, exchange, or consumption of which its subscribers are interested. As the day of publication coincides with the sailing of the Pacific Mail Steamer, these reports, corrected to the last moment before going to press, will afford the very latest information which can be obtained, surpassing, in this respect, all other periodical bulletins of prices current.

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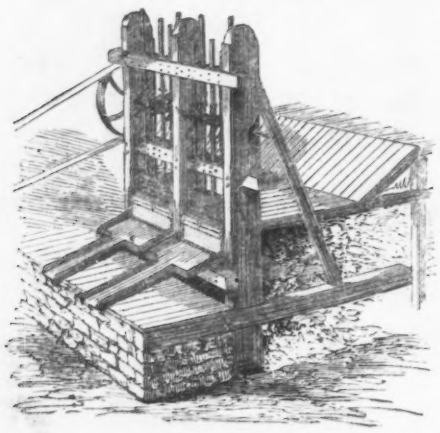

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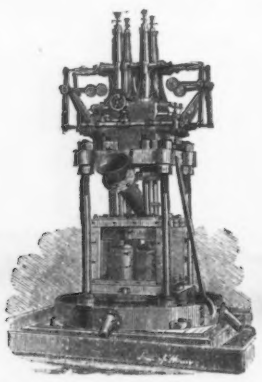

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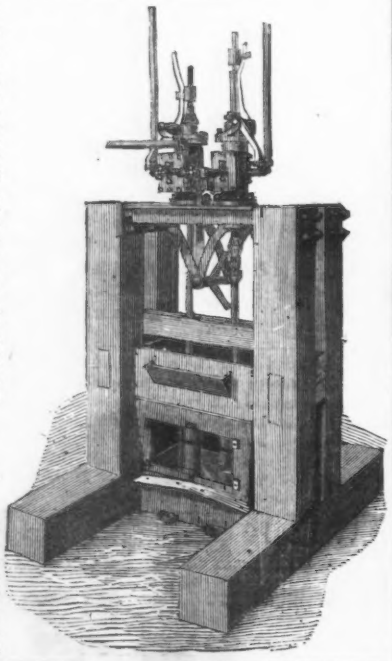

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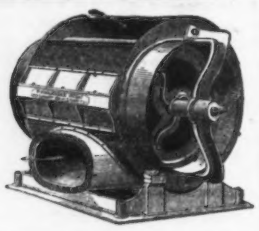

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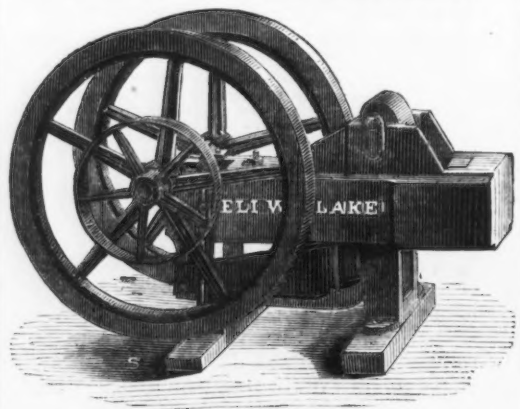

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